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OPERATING FLOOR, GRAND FORKS FILTERS

GRAND FORKS RAPID SAND FILTERS

Two Small and Two Large Settling Basins—Alum and Hypochlorite Fed Together into Water—Most of Purification Effected in Settling Basins—Water Reaching Filters Practically Sterile

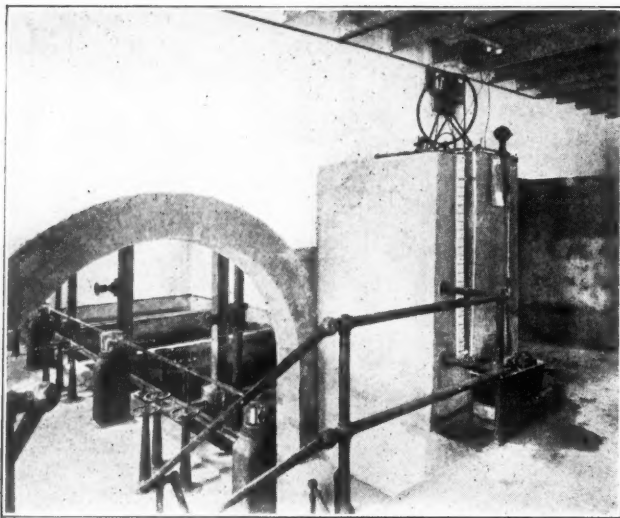
By H. G. LYKKEN, City Engineer

THE city of Grand Forks, N. Dak., takes its water supply from the Red Lake River which has a flow ranging from 600 second feet at its lowest stages in the winter time to an average summer run off of about 2500 second feet. During the spring freshets and after rains the water is very turbid, carrying a fine clay with some black loam from the fields along the bank. There is, however, more or less turbidity at all times.

The hardness averages about 17 grains per gallon, equally distributed between the sulphates and carbonates of lime and magnesia. The water is considerably polluted by the sewage from small towns above the city. In the winter time, when the flowage is at the lowest stage and the river frozen over with from one to two feet of ice, the B. coli will average for weeks at a time over 20, and often run over 40 per cubic centi-

meter. In the summer time this falls down to an average of about four. The bacterial content runs from 1,000 to 1,500 in the winter and increases to 7,000 to 10,000 in the summer.

The city of Crookston, with a population of 7,500, is situated about thirty miles up stream and is the chief source of the sewage contamination. By hourly bacteriological tests of the water at Grand Forks, made especially at its lowest stages in the winter time, it has been possible to show a decided fluctuation in the presence of the B. coli corresponding to the maximum and minimum flow of the sewage in the city above. The sewage flow in a city of this size will be very small at certain hours of the night with a maximum occurring at a certain time or times during the day. Owing to the small amount of water flowing in the river a decided variation in the pollution will



HYPO TANK, WITH GLIMPSE OF OPERATING FLOOR.

consequently result. The fact that this variation can be detected is proof of the positiveness and directness of the contamination and its dangerous character if charged with germs of pathogenic origin.

The first attempt at water purification in Grand Forks had its inception in a frightful typhoid epidemic that devastated the city in the spring of 1894, when about 25 per cent of the population was stricken and about 200 deaths occurred. A slow sand filter of one-half acre, modeled after the Lawrence, Mass., plant, was installed the same fall. This filter did service till the fall of 1910, although having been inadequate in size for some years. During all this time few tests were made as to its efficiency, as no pronounced epidemics of typhoid again occurred and it was generally taken for granted that the filter made the water safe. No doubt a great improvement was effected; at least, the water was perfectly clear and free from turbidity and color at all times.

Yet only 20 per cent of the more frequent tests made of the water during the last two years that the slow sand filter was in service showed absence of *B. coli*. In other words, the water was never safe, as disease germs might get through and be present at any time. This is readily understood when the great contamination of the water is considered, and in view of the further fact that, owing to the turbidity of the water it was sometimes necessary to scrape the sand as frequently as every ten days. The settling basins, even with the use of alum, seemed unable to remove the finer silt that would clog the sand. As only the one sand bed, run at its maximum capacity, was provided, it was necessary to begin filtering immediately after the scraping, if this could be called filtering.

Two facts can be established out of the experience of this city with a slow sand filter. One is the absolute necessity of two or more beds with capacity sufficient that a scraped bed can be properly put in condition for filtering before it is again put into service, which requires at least four or five days. And a second is the almost certain futility of attempting to filter turbid water with a slow sand filter. I mean here river water with fine clay in suspension that even several days of sedimentation will not remove. The cost of scraping or cleaning the sand beds, with the unavoidable loss of sand, makes it too expensive.

On account of the high cost of sand, heating the filter and settling basins in winter, and frequent scrapings, it cost from \$5,000 to \$7,000 a year to operate the one-half acre of sand. The average water consumption was less than 1,000,000 gallon per day, making the filtration costs excessive.

In the fall of 1910 the City Council voted to make the change to a rapid sand filter with increased capacity, and the plant now installed was constructed by the Pittsburgh Filter Company in accordance with plans made by the writer. Considerable opposition was met with at first from those who had taken it for

granted that the slow sand filter had always given perfect results, and who were reluctant to try something they thought new. Owing, however, to the location of the old filter plant in a place where no additional ground was available for increasing its size to meet the increasing demand for water, and also to the fact that it was becoming more and more difficult to get the quality of sand necessary, all opposition had to give in.

The additional building made necessary by the new filter consists of a brick structure 35 feet by 78 feet, two stories in height, having reinforced concrete floors throughout. This building was constructed on part of the space formerly occupied by the old sand bed. The rest of the space is used as settling basins. A concrete wall dividing this old filter bed into two equal parts was also constructed, as shown by the plans.

As best shown by the plan here referred to, the plant consists of two small trough-like basins into which the water is first pumped and flows the entire length of both. They are so arranged, however, that either one can be thrown out of service for cleaning, at which time the water is pumped into the other. Being trough-like in construction, with sewer openings at the bottom, they are readily cleaned by simply drawing them off while keeping the material in agitation with a fire hose. A basin half full of mud is cleaned out in a few hours' time with a minimum loss of water and labor.

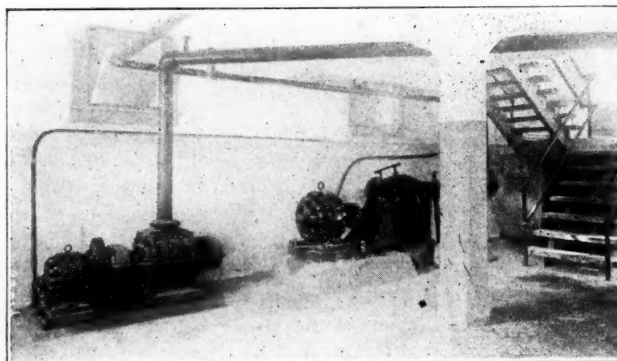
As the water leaves the small settling basins it enters a distributing chamber where it is controlled by gate valves and may be let into either or both of the larger settling basins. The water is distributed along one end of these large settling basins by a vitrified pipe imbedded in concrete and placed along the floor. Openings are provided at intervals of $2\frac{1}{2}$ feet. No baffles are used and the water is permitted to move freely to the opposite end of the basins, which are 140 feet in length. At this end the water is taken off near the top by a collecting trough from which it enters the filter building. The water is carried at about 10 feet in depth in all the basins.

The present plant was designed for 2,000,000 gallons capacity in four units, the basins being made somewhat larger, however, than is the general practice on account of the small head available. Space for four additional beds is provided for when the need of the city may demand it. On the first floor of the filter building is a large room, 26 by 33 feet, in which the wash pump and blower are located, and which provides ample room for storage of chemicals, etc.

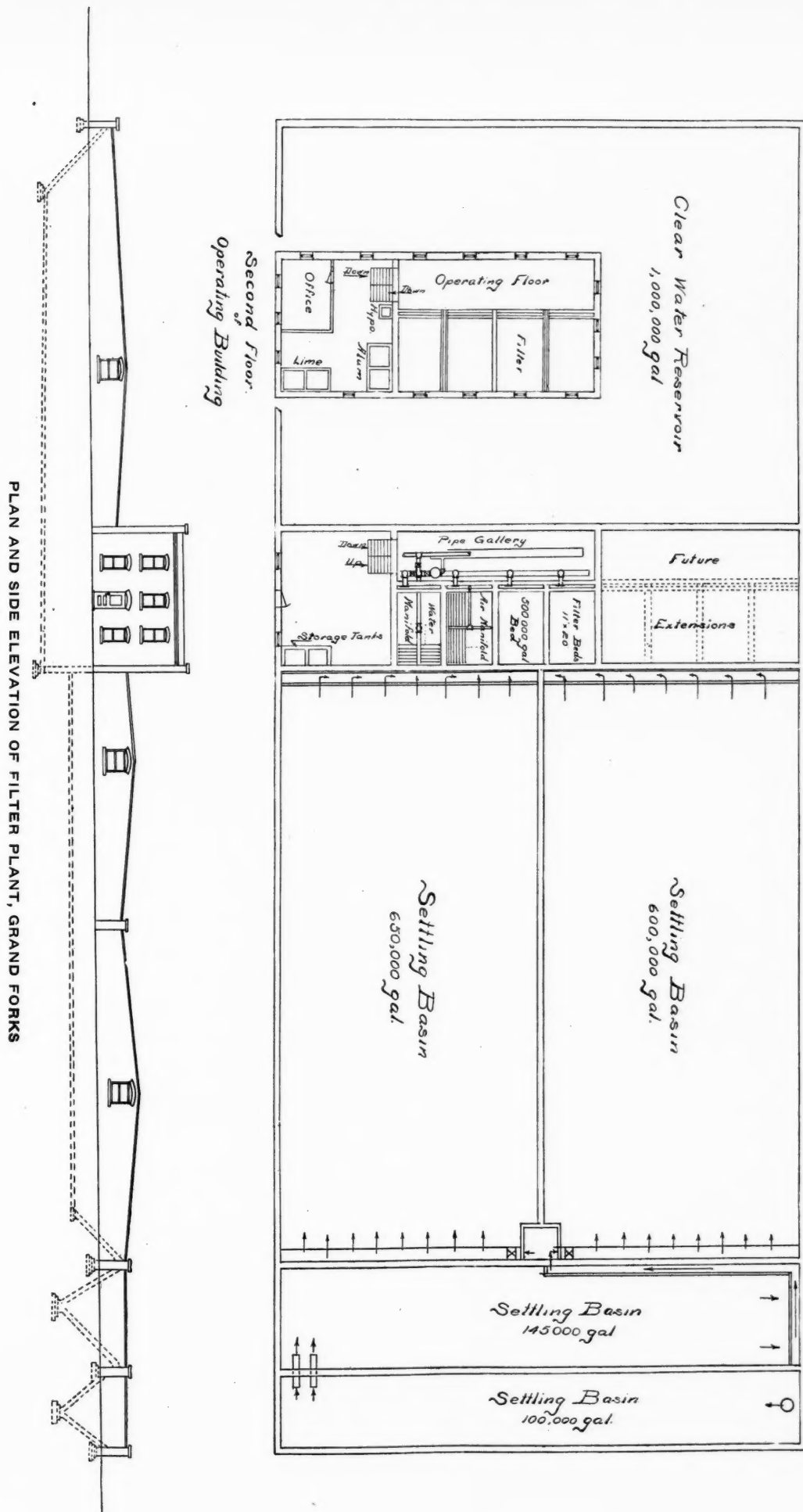
A door with a few steps down leads into the filter gallery. A stairway up leads to the operating floor in front of the filter basins, and, in the front end of the building, to the mixing tanks and the operator's office.

The water as it enters the filter building flows in a trough between each pair of filter beds to the operating end of the beds, where all gates for controlling the water both for filtering and washing are located. The filtered water flows into the 1,000,000 gallon clear water well, or may be by-passed directly to the pumps.

From 10 to 15 pounds of aluminum sulphate and one pound of hypochlorite of lime per 100,000 gallon of water filtered



WASH PUMPS AND BLOWER.



is used. These chemicals are mixed in separate concrete tanks in the mixing room, a continuous stirring device being used in the hypo tank. Both solutions are then run in the same pipe and enter the raw water in the supply pipe from the pump. This method of feeding the chemical was determined upon after considerable experimentation and feeding the chemicals at various points and in various ways. The results establish beyond a doubt that the chemicals fed in this manner do not interfere with each other; on the contrary, the proper reaction seems to be facilitated, though this has not been accurately established.

The water is tested by a competent bacteriologist two to three times a week, several samples being taken each time. After several months of service in no single instance has *B. coli* been found in the filtered water. The number of bacteria in the filtrate average below 20 per cubic centimeter. When it is considered that at all times the water is highly polluted and that during the greater part of this period the *B. coli* ran from 30 to 40 per cubic centimeter, the efficiency of the treatment becomes apparent, and in addition the fact that the efficiency of the hypo is in no way impaired by being added to the water in its muddiest condition, as it enters the settling basins, and together with the alum. The hypo is, of course, the chief agent accountable for the bacteria efficiency, but being added in the small quantity of one pound to each 100,000 gallons of water certainly no objection can be raised against its use. The cost is negligible.

The whole available settling area is utilized, with the result that the water as it enters the filter beds is fairly clear irrespective of how muddy it may be in the river. Most of the mud is thrown down in the small basins, where it is readily washed out. Most of the remaining material goes to the bottom in the larger basins, which can be alternately drained and cleaned. It is anticipated that one cleaning a year will be sufficient with these, however.

At the present rate of filtration, 24 to 36 hours elapse between the time of application of the alum and the time the water reaches the filters. This is perhaps not in accordance with common practice, but no difficulty is experienced in getting a blanket on the filters. Sufficient material goes over, whether it be alum floc or just clay, to form the proper filtering medium. Care is taken to let each bed stand for some time after each washing to permit the sand to adjust itself and the slime film to form on top. In this case no attempt is made to depend on the filter beds to strain out the bacteria. The filters as operated give a perfectly colorless and clear water. The preliminary treatment in the settling basins is depended upon for the bacteriological efficiency.

The advantage of this method of operation is obvious. All the water in the settling basins is practically sterile so that a slight variation, or even cessation for hours of the chemical will not let any untreated water through. Much less alum is necessary as only sufficient to remove and settle the mud is used. The absence of a heavy blanket necessary for a high bacterial efficiency by the straining process alone, necessitates less washing of the beds, also less careful and expensive attention.

The filter works continuously, but is operated by one man, a young boy receiving a mere nominal wage, and such assistance by the general superintendent of the water works as may be necessary when the beds are washed. No watchman is on duty during the night, as the relative height of water in the different basins is controlled from the pumping station. The filters are washed once a week, the water being supplied by a centrifugal pump and the air by a Root blower, both electrically driven from the city power plant.

The plant is provided with automatic rate controllers, recording loss-of-head gages, and the best equipment possible in chemical feed devices and other appliances. With two to three times the amount of water available and provisions for doubling this capacity, the new filter is being operated at less

than one-quarter the cost of the old plant. But of more importance is the fact that the water is always absolutely safe, clear, colorless and sparkling. During the spring months, color due to swamp vegetation gave trouble with the slow sand filter. This has been entirely eliminated; whether it be due to the alum treatment or a bleaching effect of chlorine has not been determined.

The writer has studied in detail the plans and results of some seventy filtration plants and found that a common mistake is to make the settling basins too small. The experience of plant after plant has been that all waters carrying any silt whatsoever require more time for settling than is commonly supposed, and that in no case can the basins be too large. The settling and coagulating basins, if indeed the two can be made distinct, are in my opinion the main elements in modern water purification. By the judicious use of alum, the settling silt and alum floc will carry down much of the impurity. Then, by sterilizing the water, as well, at this point, or at least destroying all the pathogenic germs, the main object of any purification works is accomplished. By having the basins large they will act as a regulator or factor of safety interposing a larger amount of safe water between the raw water supply and the filter effluent. No sole dependence need in this case be placed on purely mechanical devices or the care of operators.

The filter beds become merely finishers in the process, removing the silt and suspended matter that still may remain in the water as well as to do all any filter can do in removing whatever bacteria that may get to them. The modern type of rapid sand filter is eminently suited for this purpose on account of its simplicity and economy in operation. With conveniently arranged settling basins, the cost of water purification becomes a small matter in cost. Where no sewage pollution exists the sterilizing can, of course, be dispensed with. A coagulant added in large basins, giving the water ample time to settle, reduces the cost of filtering to a minimum. With sewage-polluted water, however, sterilization in the settling basins has much to commend it and reduces both the difficulties of attaining the results required and the cost of operation.

NEW YORK'S HEALTH CONDITIONS

MORTALITY records of New York City for the first quarter of 1911, which have recently been made public, show most gratifying improvement over those of previous years. The death rate from all diseases was 17 per thousand, as against 17.45 during the first quarter of 1910. Comparing this year with the previous five years we find a falling off in the number of typhoid deaths of 35, diphtheria and croup, 261, consumption, 250, acute respiratory diseases, 545, and smaller decrease in most of the common diseases; there being increases, however, in the deaths from whooping cough, influenza, organic heart diseases, diarrhoeal diseases under five and accidents; each of these increases running under one hundred, except heart disease. As these are total cases, with no allowance for increase in population, the percentage rates would show still more favorable figures. Most of the decrease was among the younger children, amounting to 468 deaths in children under one year, and 1,099 in children under five years. On the other hand there was an increase of 85 in those over 65 years. As death must come at some age to every one, sanitation and medicine can but postpone it, consequently the measure of their effectiveness is not only the reduction of death rates but also the transferring of deaths from the younger to the older groups of the population.

There was a decrease of 1,575 deaths in tenement houses, an indication of the fact, actually shown by other figures, that a large percentage of the child mortality is found in such districts. The general death rate during the previous five years had been an average of 18.33; therefore the rate during this quarter of 1911 was more than 7 per cent. lower than the average for the previous five years.

SEWAGE-POLLUTED SEA WATER

Chemical Changes Occurring in One Per Cent Mixtures of Sewage with Sea Water, as Determined by Laboratory Experiments

An investigation of the chemical changes which occur in sea water when mixed with one per cent. of sewage was made for the Royal Commission on Sewage Disposal (England) by E. A. Letts and E. H. Richards, the former professor of chemistry in Queen's College, Belfast, and reported upon in a paper before the Royal Institute of Public Health. This paper, somewhat condensed, was as follows:

Eighteen samples of sea water were collected from the Irish Channel and analyzed. The average and extreme results obtained were:

	NITROGEN IN PARTS PER 100,000 AS:	
	Average.	Extremes.
Free ammonia.....	0.0003	0.0014—0
Albuminoid ammonia.....	0.0073	0.011 —0.005
Nitrates.....	0.0043	0.009 —0.002

Free Ammonia.—It will be seen that the amount of this factor was minute, but the authors have satisfied themselves that it is apt to increase when the samples are kept. This fact has given considerable trouble in certain of the experiments which they are conducting. The authors have some grounds for believing that the increase in ammoniacal nitrogen is due to the decay of the minute organisms which constitute the *plancton* found in both fresh and sea water.

As this matter is of some importance, further experiments are in progress.

Albuminoid Ammonia.—It will be seen that on an average the amount in the samples was about twenty-five times as great as that of the free ammonia, and the question arises as to how much of this is due to living organisms, and how much to dissolved nitrogenous compounds?

Experiments are therefore in progress on this matter, the plan being to determine the albuminoid ammonia in the sample as drawn, and again after filtering it through a Pasteur-Chamberland filter.

Nitrates.—The authors have satisfied themselves that nitrates were present in the samples of sea water examined by them. In certain of these nitrates were tested for qualitatively, and their presence at once indicated either by the blue tint which was produced when some of the water was added to a 2 per cent. solution of diphenylamine in sulphuric acid, or by the brucine test. Regarding the latter, 25 c.c. of the sea water placed in a porcelain dish along with a few drops of brucine-sulphate solution, and 25 c.c. of strong sulphuric acid added, showed the transient pink color quite distinctly and a well-marked yellow tint afterwards, which was permanent for twenty-four hours, while in a comparison experiment with the same quantities of distilled water and reagents, the mixture remained colorless.

The nitrates were determined by the zinc-copper couple in lack of a better method, and while it is possible that the determinations were affected by the effect which Purvis and Courtauld discovered in relation to the breaking down of the organic matter by the couple, with evolution of ammonia, the error, if introduced at all, was probably minute and sufficiently constant to render the results strictly comparable with each other.

A study was made of the chemical changes occurring in one per cent. mixtures of sewage and sea water from the Irish Channel and these compared with those taking place in corresponding mixtures of sewage and fresh water, the samples being incubated in completely filled and stoppered bottles at definite temperatures after being saturated with air at those temperatures.

Three series of such experiments have been made, viz:

(1) With one per cent. Belfast sewage (screened and settled) at 65° F. for five days. (One analysis of each).

(2) Ditto. (But with a sample collected on a different day) at 80° F. (Analyses were made of the original mixtures when made and after intervals of one, four, seven and thirty-five days).

(3) Ditto. (But again with a sample of sewage collected on a different day) at temperatures of 60°, 70° and 80° F. respectively. (Analyses were made of the original mixtures when made and after intervals of five, fourteen and forty-two days).

In all, nearly 300 separate determinations were made, so that the work was laborious.

The following general conclusions were drawn by the authors from the results of the analysis.

(a) **Free Ammonia.**—In each of the three series the analysis of the original mixtures showed a distinctly greater yield of free ammonia in those containing sea water. Thus:

NITROGEN AS FREE AMMONIA AS PARTS PER 100,000 IN THE ORIGINAL MIXTURE.			Ratio of Ammonia in Sea-water mixture to that in Tap-water Mixture.
Sea-water Mixture.	Tap-water Mixture.		
(1) 0.030	0.017		176:100
(2) 0.030	0.018		167:100
(3) 0.041	0.035		117:100

Probably this effect is due to the action of the alkaline salts in the sea water on the nitrogenous matters of the sewage. Obviously, this is a point of considerable importance when interpreting the results of analysis of polluted sea water samples, for if the amount of free ammonia be taken as the index of sewage pollution, as is frequently done, a given sample of sea water may appear to be much more highly polluted than a sample of fresh water containing the same proportion of sewage, and it may be nearly twice as much.

(b) **Albuminoid Ammonia.**—This did not diminish by more than about one-third of the original amount in either of the series after an interval of five to six weeks. Both the fresh and sea water mixtures behaved similarly as regards this factor, and temperature did not appear to exercise much influence on it in either.

(c) **Dissolved Oxygen.**—The rate of disappearance of dissolved oxygen in four or five days at temperatures between 60° to 80° F. was very similar for both the sea and fresh water mixtures. Thus:

DISSOLVED OXYGEN DISAPPEARING IN C.C. PER LITRE AT N.T.P.		
Tap-water Mixture.	Sea-water Mixture.	
(1) 1.5	1.4	5 days at 65° F.
(2) 1.1	1.4	4 " 80° "
(3) { 1.2	1.6	5 " 60° "
{ 1.9	1.8	5 " 70° "
{ 2.4	2.0	5 " 80° "

These results have a certain amount of importance as it has been suggested that the salts of sea-water interfere with the growth and inhibit at an early stage the development of the organisms present in sewage.

There is good reason for believing that disappearance of dissolved oxygen in polluted waters is largely, if not entirely, due to micro-organisms, the process in its earlier stages being analogous to respiration, and as a consequence the oxygen becoming converted to a considerable extent into carbonic anhydride (as was indeed proved to be the case in the experiments performed by the authors); and if this be so, the disappearance of dissolved oxygen is an index to bacterial activity, which was therefore considerable in the periods mentioned above, and was practically the same in both the sea and fresh water mixtures. The authors are therefore of the opinion that the salts in sea-water do not inhibit the first or "carbon" stage of fermentation occurring in such water when polluted.

(d) The disappearance of dissolved oxygen after five or six weeks is distinctly greater in the tap-water than in the sea-water mixtures. Thus:—

DISSOLVED OXYGEN DISAPPEARING IN C.C PER LITRE AT N.T.P.		
Tap-water Mixture.	Sea-water Mixture.	
(2) 4.6	3.8	5 weeks at 80° F.
{ 3.3	2.8	6 " 60° "
(3) { 4.3	2.9	6 " 70° "
{ 5.2	4.5	6 " 80° "

But it must be recollected that sea-water saturated with air

at a given temperature contains less oxygen than fresh water similarly saturated. Thus: One litre sea-water saturated with air at 60° F. and 760 mm. contains 5.8 c.c. dissolved oxygen at N.T.P.; one litre distilled water under the same conditions contains 7.2 c.c.

Distilled water therefore contains over 22 per cent. more dissolved oxygen under these conditions than sea-water.

But apart from this, the more rapid disappearance of dissolved oxygen from the tap-water mixture is probably to be explained by differences in the behavior of the two mixtures in respect of the second or "nitrogen" stage of fermentation which occurs in polluted waters.¹

(e) *Nitrification*.—This nitrification occurred to a decided less extent (under the conditions of the authors' experiments) in the sea-water than in the tap-water mixtures. In the latter it commenced about the fourteenth day and was practically complete (in relation to the free ammonia originally present) in five weeks. While on the other hand the most favorable result with the sea-water was the nitrification of less than one half the free ammonia originally present.

Nitrates were determined by the zinc-copper couple in all the samples, and while it is possible that the results in the case of the sea-water mixtures were influenced by the Purvis-Courtauld effect, the error if introduced at all would probably be the same in all the determinations and would therefore not affect the results in relation to the gain in nitrates.

C. Fowler concluded that only the stage of nitrite formation is reached when sea-water is incubated with sewage sludge. Adeney (*loc. cit.*) came to the same conclusion in comparative experiments with 20 per cent. mixtures of sewage and tap-water on the one hand, and sea-water on the other, the experiments being carried out under aerobic conditions, while Purvis in collaboration with others, also observed the production of nitrites in incubated samples of sea-water polluted with sewage.

The authors at the end of their experiments in Series 3 examined carefully for nitrites in all the samples, but their notebooks only record "doubtful traces" in the cases of two of the sea-water mixtures.

As this matter is one of some importance, and the results obtained as yet are not absolutely conclusive, they are conducting further experiments on it.

(f) *Effects of Temperature*.—Regarding the effects of temperature on the nature and speed of the chemical changes occurring in the polluted mixtures experimented with, there can be no question that the amount of dissolved oxygen disappearing was greatest throughout the experiments of 80° F., least at 60° F. and intermediate at 70° F. in both the sea-water and fresh-water mixtures.

But it is difficult to say whether nitrification was promoted or retarded by increase of temperature.

In the third series of experiments with the tap-water mixture the latter effect was observed, while with the sea-water mixtures the results were irregular and not carried far enough to be conclusive. At the highest temperature, the exhaustion of the oxygen by the carbon fermentation was quite possibly too great to allow of the subsequent nitrogen fermentation, and also the amount of dissolved oxygen originally present was lowest.

At 60° F. not only was more oxygen present originally, but the results show that after a fortnight or so, both kinds of fermentation proceeded together, so that it is conceivable that the relative powers of the two classes of bacteria concerned were more evenly balanced.

If such were the case, it may involve a practical point of some importance, for in the case of a water continuously polluted in warm weather the whole of the available oxygen may be used up in carbon fermentation as fast as the water

it naturally aerated, and nitrification as a consequence be impeded.

In colder weather on the other hand, nitrification may proceed more rapidly or with greater ease.

The fact that green *algæ* are most abundant in water at the time of the year when the former conditions prevail, may perhaps be Nature's provision to balance matters, since by the absorption of ammoniacal nitrogen these *algæ* would prevent an excess of unoxidized nitrogen from accumulating in the water, while the *algæ* would also arrest or prevent putrefactive changes by supplying an abundance of dissolved oxygen.

MISSOURI BILLBOARD DECISION

THE Supreme Court of Missouri recently handed down a judgment affirming a previous decision sustaining the St. Louis billboard ordinance. This ordinance was passed in 1905 as part of a revised building code; an injunction was granted in January, 1906, appealed from at once by the city and a decision rendered in March, 1910, one judge dissenting. This decision has just been affirmed.

The sections of the ordinance in question required:

1st. That no structure, building or shed could be altered, repaired or removed without a permit from the Commissioner of Public Buildings.

2nd. That various fees should be paid for such alteration or repair, one dollar being the fee for every 25 feet of the area of a sign and one dollar for every 5 lineal feet of a billboard.

3rd. That no rotten or unsafe sign shall be permitted in any place and that no sign exceeding 20 square feet shall be erected on any building without a permit. None but metal signs may be attached to any building if larger than 3½ by 10. No sign shall project more than 18 inches over the building line, nor nearer than 8 feet from the ground or pavement, nor to interfere with any fire escape.

4th. No billboard having more than 25 square feet of area shall be erected without a permit from the Commissioner of Public Buildings and on his approval. No billboard shall exceed 14 feet in height above the ground and there must be an open space of at least 4 feet between the lower edge of the board and the ground. No billboard shall be nearer than 6 feet to any building or the side line of any lot nor nearer than 2 feet to any other billboard, nor shall any such billboard exceed more than 500 square feet in area, nor to approach the building or alley line nearer than 15 feet. Rotten or unsafe billboards are subject to removal.

The opinion says in part:

In this general statement, we might also add that there is but one virtue connected with this entire business, and that is the advertising itself. This is a legitimate and honorable business, if honorably and legitimately conducted, but every other feature and incident thereto have evil tendencies, and should for that reason be strictly regulated and controlled. The signboards and billboards upon which this class of advertisements are displayed are constant menaces to the public safety and welfare of the city; they endanger the public health, promote immorality, constitute hiding places and retreats for criminals and all classes of miscreants. They are also inartistic and unsightly.

The amount of good contained in this class of business is so small in comparison to the great and numerous evils incident thereto that it has caused me to wonder why some of the courts of the country have seen fit to go as far as they have in holding statutes and ordinances of this class void, which were only designed for the suppression of the evils incident thereto and not to the suppression of the business itself. While advertising, as before stated, is a legitimate and honorable business, yet the evils incident to this class of advertising are more numerous and base in character than are those incident to numerous other businesses which are considered *mala in-se*, and which for that reason may not only be regulated and controlled, but which may be entirely suppressed for the public good under the police power of the State. My individual opinion is that this class of advertising as now conducted is not only subject to control and regulation by the police power of the State, but that it might be entirely suppressed by statute, and that, too, without offending against either the State or Federal Constitution.

¹ Adeney (Appendix vi. to Fifth Report of Royal Commission on Sewage Disposal, p. 55), experimented with 20 per cent. mixtures of sewage with both tap- and sea-water under aerobic conditions, and his results in relation to the absorption of dissolved oxygen agree to a considerable extent with those obtained by the authors.

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JUNE 21, 1911.

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Laboratory and Field Investigations

WHILE we do not often publish in *Municipal Journal* articles extremely technical in their nature, believing that these have more place in text books than in periodicals, the matter of disposal of sewage by dilution in large bodies of water is such an important one at the present time that we have made an exception of a brief paper dealing with this subject which is abstracted in this issue. It will be noticed that these experiments were made with mixtures of sea water and sewage, which mixtures were made and retained in the laboratory. It would seem that this was the only way to be at all certain of just what character of sewage entered into the mixture, and in what proportion; but results from such experiments should not be considered as too closely paralleling those which occur in the actual disposal of sewage by dilution, but only as indicating what is likely to occur under laboratory conditions; the conclusions being modified to allow as far as possible for other affecting conditions which may exist in each particular case. A suggestion of one such condition is given in the concluding paragraph of the paper, where the authors suggest that the green algæ present in water during the summer months may absorb sufficient ammoniacal nitrogen to pre-

vent an accumulation of unoxidized nitrogen in the water and arrest or reduce putrefactive changes by supplying dissolved oxygen. These algæ would, of course, not be present in the laboratory experiments, and thus the latter might indicate actions and resulting conditions considerably different from those which would take place in actual cases under consideration.

There are many other conditions, mostly physical, which might have a very considerable and even a determining effect upon the conditions resulting from discharging sewage into water, among these being the stirring up of the water due to the passage of boats, the vertical currents caused by alternate heat of day and cold of night and by irregularities in the bottom combined with the current of a stream or motion of the tide. The effect of animal life also, as well as of the vegetable life referred to, may be more or less appreciable, especially in the removal of the finer suspended matters.

The laboratory study of chemical and bacteriological changes has its value which we would not deny or minimize, but these should be supplemented by careful observation and study of actual conditions and what effect they may produce. Studies of this kind—such as are being made by the Metropolitan Sewerage Commission of New York, for instance, which were described in our issue of Sept. 14, 1910—are apt to bring about many discoveries which are at first apparently inconsistent not only with laboratory experiments but frequently with each other, but which probably can generally be interpreted to mean, not that either laboratory or field tests are incorrect, but rather that some further affecting conditions must be looked for.

Fire Hydrant Rates—a Correction

IN the article bearing this title in last week's issue, the sentence at the beginning of the second paragraph on page 843 should have read "The authors assume that the average per capita consumption in gallons per day may be taken to be $32 \sqrt[5]{\frac{X}{T}}$ ". A number of copies were printed before it was discovered that the printers, in spite of repeated instructions from the editorial department, had omitted the index figure 5.

Municipal Abattoir in Amsterdam

ONE of the largest and most important municipal utilities of Amsterdam is the city abattoir. It is situated at the eastern end of the harbor, surrounded by canals and docks and connected by branch lines with the local railroad system.

The buildings comprise two slaughtering houses for cattle, a slaughterhouse for hogs, and one for horses; three stables for cattle, and three each for hogs and horses. There are other buildings also, for the treatment of waste and hog's hair, for blood drying, tripe boiling, a forge, the sterilization of meat, a laboratory for the microscopic examination of trichinæ and offices of administration. There is also a space for a cattle market, on which are a café and stables for visitors' horses and vehicles. Once a canning factory was operated, but became unprofitable and was abolished. The total surface occupied by the buildings and cattle market exceeds 100,000 square yards.

All the slaughtering of animals for food in Amsterdam must be done here. Some meat slaughtered elsewhere is brought to the city, but it must be inspected at the city abattoir and be marked with a stamp the same as meat slaughtered there. If any such meat is found unfit for consumption it is converted into fertilizer. Meat not perfect is sometimes made edible by sterilizing and salting.

The slaughtering is not done by the city, but by owners of stock or dealers in meat, who pay for the use of the abattoir 64 cents for each cow, ox, or horse, 34 cents for a hog or a fat calf, and 10 cents each for a young calf, a sheep, or a goat. For examining meat not slaughtered there, the charge is about a fifth of a cent a pound for beef and pork and a tenth of a cent for other meat. The charge for examining a live animal is 56 cents. The meat is taken from the abattoir to the shops in town in specially arranged conveyances.

A report of the abattoir's operations is prepared annually, but that for 1910 is not yet completed. In 1909, the total number of animals slaughtered was 150,530; in 1908 it was 144,025. —*Consul Frank W. Mahin in Consular and Trade Reports.*

CONCRETE METHODS IN ROCHESTER

Further facts and two corrections concerning the description published under the above title in our issue of June 7 and the preceding description in that of May 31st are contained in a recent letter from principal assistant engineer, John F. Skinner of Rochester. He states that the hammer or "monkey" used in the pile driver employed for compacting the clay in the expansion joints between wall blocks weighed 200 pounds and not 20 pounds. Also that in the Central avenue bridge no re-tempering was contemplated for the concrete proper, but only for the mortar used in bonding the new and the old concrete.

Each keyway between blocks is now furnished with flush-handled covers set over the keyway flush with the top of the wall coping and easily removable when it is desired to repack the clay. Mr. Skinner states that he has employed the same plan of keyway and clay packing in several other constructions; namely, between the wall blocks of the swimming pool at one of the Rochester municipal bath houses, where the keyway consisted of an opening 4 in. square, one-half in each block. A similar plan was adopted for a sprinkling filter designed in 1906 in connection with the Sommerville sewerage system, which plant was built in the following year; the method in this case being to form the keyway by inserting a 3-in. wrought iron pipe between the blocks as a form, occasionally turning the pipe during the setting of the concrete so that it could be withdrawn. When the pipe was removed the keyway was packed with clay. The same plan was used in the design for a sprinkling filter system which will probably be constructed this summer. It was also employed in the construction of the water works reservoir at Olean, N. Y., which was designed in 1907.

SMOKE ABATEMENT IN BOSTON

Result of Six Months' Enforcement—New Law Practicable—Simple Standard of Measurement and Co-operation with Plant Owners.

PRONOUNCED progress has been made in the abatement of the smoke nuisance in Boston under the new state law which went into effect July 1 of last year, but which has been actually enforced only for a little more than six months. Owing to complications with the state Civil Service Commission over the selection of a smoke inspector this official, provided for by the new law, was not really in office until the end of last November. Since then, however, he has made more than 1400 smoke inspections, using the Ringelmann charts as a standard; has given instruction in the fireroom to many firemen and engineers; and has brought the smoke output, with one or two exceptions, within the maximum allowed by the law.

The new law has proved perfectly practicable. There has been no difficulty whatever over the enforcement of it. There have been no legal rulings in regard to any of its provisions, simply because no owner of a power plant has felt that there was any use in contesting the law. How little resistance there has been will appear from this fact: The law requires the Board of Gas and Electric Light Commissioners to give a public hearing to any person charged with violating the smoke law before they proceed in the courts to enforce the penalties provided by the law for violation. Not one such hearing has been held. Power plant owners have recognized the necessity, and the prudence, of obeying the law; have realized that they could gain nothing by fighting it; and have, therefore, set themselves energetically to complying with it.

Two main reasons lie behind this wholesome and gratifying unanimity of action on the part of power plant owners. In the first place, the standard of measurement—the Ringelmann

charts—is so simple that the owner's engineer can apply it just as well as the state inspector. The framers of the law studied the experience of other cities, and came to the just conclusion that a good deal of the trouble elsewhere had been due to variable and capricious standards—what the railroad man would call "head rates," peculiar to the inspector who happened to be on the job. When the power plant engineer doesn't know what to expect from the inspector he trusts a good deal to luck in the hope of escaping condemnation. The definite standard of smoke intensity prescribed by the new law is the foundation of its success. The owner doesn't have to wait for the inspector to tell him that he is breaking the law; let him give his engineer a little practice and he will know the whole story, and the requirements, for himself.

Second in importance in getting good results from the law has been the attitude of the state in offering to power plant owners friendly co-operation toward smoke reduction, instead of merely a rigid and stringent enforcement of a severe law. The statute itself makes the standards increasingly severe over a period of three years in order to give power plants ample time to become accustomed to the new standard of smokelessness in operation. Following out this idea the state inspector under the law, while applying the standards of the first year of the statute fully and without favoritism, has done everything in his power to co-operate with the owners and operators of power plants, and to assist them in finding ways to avoid making more smoke than the law allows.

This co-operation between the state inspector and the workers in the power plant has naturally resulted in a much more complete knowledge of what power plant usage commonly is than it would be possible to get in almost any other way. Perhaps the commonest disclosure is that the great majority of firemen do not know how to fire properly, and that the great majority of engineers take no responsibility whatever for the way their furnaces are fired. There is a small proportion of the "don't care" element in each class; but the greatest obstacle has been found to be lack of proper knowledge. More than a few engineers and firemen, for instance, have complained to the state inspector that they did not know the proper way to use the steam jets with which their furnaces were equipped. In such cases, and many other kinds, it has been the task of the inspector to go into the fireroom and teach proper methods. This has often gone further and led to a considerable overhauling of the boiler plant.

In something like twenty-five lumber plants, for instance, the fuel has been wet shavings, fed into the furnaces above the grate in an air-blast. This blast of shavings has been deflected upward by the bridge wall, in most instances, and so chilled by contact with the boiler that much of the incipient combustion went no further than the production of great quantities of brown or yellowish smoke. It was the smoke inspector who discovered that the way to avoid this smoke and to save fuel was to cut down the bridge wall practically to a level with the grate bars. All but one of these lumber plants, burning wet shavings, is now inoffensive within the limits prescribed by the law for the first year of operation.

It is worth while to note, in connection with the smoke from shaving-burning plants, that their smoke involved some nice discretion on the part of the inspector because the wood smoke differs entirely in color from the grays presented by the Ringelmann smoke charts. The law, however, declares that smoke must be tested for its "density," and under this provision the inspector has had to cut away from the natural tendency to test smoke by its relation to the depth of the grays on the charts, and to make his tests depend, instead, on the degree to which he can see through wood smoke. This may sound difficult, but for a technically trained man, like the Massachusetts inspector, it is in no wise difficult. Taken altogether, the Massachusetts smoke law is notable for its entire workableness, and for the fact that it has in six months been applied without serious friction and with decided benefit to the atmospheric conditions in and about Boston.

NEWS OF THE MUNICIPALITIES

Current Subjects of General Interest, Under Consideration by City Councils and Department Heads—Streets, Water Works, Lighting and Sanitary Matters—Fire and Police Items—Government and Finance

ROADS AND PAVEMENTS

Use Street Car for Sprinkling

Birmingham, Ala.—The city of Birmingham has accepted a plan of the Birmingham Railway, Light and Power Company to operate an electric street car sprinkler. For thirty days the plan as outlined will be tested, and if at the expiration of that time it is producing the benefits claimed for it the service will be retained. It is planned to operate the car twelve hours per day at a total cost of \$480. Of that amount the city is to pay \$280, while the company will pay the remaining \$200, provide the car, provide the men and work the service twelve hours per day.

Improve Town by Laying Pavements

Williamsport, Md.—The street committee of the Town Council has begun making extensive improvements to the streets of the town, beginning operations on the main block of Conococheague street, which has been macadamized and is now being rolled. A block on Potomac street will next be treated in the same manner and the improvements will be continued throughout the summer at considerable cost.

Street Improvements Blocked for Two Years.

Spokane, Wash.—Practically no more street improvements ordered for two years in Spokane is the proposition the City Commissioners are facing as a result of the new State law which recently went into effect. According to Commissioner Coates nearly every street improvement made by the city costs more than the limit of 50 per cent of assessed valuation set by the new law. He says the new condition means that almost all street improvements except those already initiated by petition or by resolution of the Council will be halted till the Legislature can meet again to correct the mistake in the new law. The clause providing that no improvement costing more than 50 per cent of the assessed valuation of property is the result of a mistake made by a recording clerk at Olympia.

Want County Money for City Streets

Lexington, Ky.—Believing that the five magisterial districts included in the city of Lexington are entitled under the Kentucky statutes, section 1888, to their pro rata of the fund apportioned annually by the County Fiscal Court for the maintenance of the roads of the county, which would aggregate from \$30,000 to \$50,000 annually on the basis of the county apportionment, Mayor Skain has brought the matter officially to the attention of the General Council and that body has directed the City Solicitor to make an investigation of the city's claim, which, if sustained, will mean that this amount will be available for repairs and maintenance of the streets of Lexington.

Ten Miles of New Sidewalks Put Down

Tampa, Fla.—Tampa is enjoying a great boom in sidewalk construction, which is going on with leaps and bounds. Never before in the history of the city has so much work of this kind been in progress, and judging by the many permits which have been issued by the Board of Public Works in the past few days the work will go merrily on for months to come. It can be noted that sidewalks are being laid in all sections of the city, in the new territory as well as the downtown section.

Officials Visit Neighboring City to Inspect Pavements

Newark, N. J.—Board of Works Commissioners Mungle, O'Connell and Kraemer and Assistant City Engineer Halleck recently made a trip to Boston, Mass. They went to inspect the bitulithic pavements laid on the streets in that city. Some of these pavements have been down several years, and the Newark officials were desirous of ascertaining, by inspection, their capacity to withstand the wear and tear of heavy traffic and general use.

SEWERAGE AND SANITATION

Mason City Has Problem

Mason City, Ia.—Mason City must spend thousands of dollars in securing expert engineers and putting in and rearranging the sewage outlet east of the city limits. This was announced by Mayor Norris, who has quietly been making an investigation of conditions. For years the sewage has been emptied into Lime River, two miles below the city. Low water the past few years has allowed a great quantity of matter to collect, which has practically choked the channel of the stream, has polluted the water and caused trouble and disease. The president of the State Board of Health ventured the opinion that the epidemic of infantile paralysis may have been caused by the condition.

Abatement of Mosquito Nuisance Due to Oiling Streets

New Haven, Conn.—The annual "mosquito census" of the New Haven Board of Health shows that the number of the pests is steadily decreasing. The present plan of oiling the city streets is held largely responsible. Oil from the streets is washed into the sewers, whence it finds its way into the harbor and eventually is deposited by the tides upon the marshes where the mosquitos breed.

Fumigation Regulation

Wilmington, Del.—The Board of Health has adopted a new regulation which provides that houses in which deaths from tuberculosis have occurred must be fumigated. Heretofore it has been the custom to fumigate in such cases, but there was no law making it obligatory, and in some instances the occupants of the house refused to allow the health officers to make the fumigation. Under the new regulations, as soon as a death from tuberculosis is reported to the Board of Health an executive officer will be dispatched to the house and immediately fumigate it.

Appoint Sanitary Inspectors to Improve Conditions

Dallas, Tex.—Upon nomination by the Board of Health, five sanitary inspectors for work in the City of Dallas have been appointed by the Board of Municipal Commissioners. Their work is to be under the general direction of the Board of Health, more directly under the supervision of the city health officer. These men are to make inspections in all parts of the city, looking after any infraction of the sanitary regulations in the city, the failure to make sanitary sewer connections, the accumulations of trash or refuse or dangerous matter in alleys or about premises and the securing of evidence for cases filed in court.

Improved Sanitation of Stables Required.

Spokane, Wash.—An order for housecleaning of livery stables, affecting from 25 to 30 establishments, has been sent out by Health Officer J. B. Anderson, with the result that two big downtown stables, unable to comply with the department orders, must seek new locations. Cement floors with proper drainage, whitewashed walls and connection with a city sewer were the requirements demanded by the Health Department, with the authorization of Mayor Hindley, of over 25 stables, as a result of a recent thorough inspection of this class of business in Spokane.

Abate Nuisance of Smoking Chimneys

Salt Lake City, Utah.—Holding the smoke nuisance to be vital in the civic improvement problem the sanitation committee of the Commercial Club has decided to wage a war of extermination against the smoking chimneys of the city, and authorized the chairman to appoint a subcommittee of five to find out why the city ordinances on the subject are so repeatedly violated. A hotel proprietor told the committee that he had installed a smoke consumer that not only solved his smoke problem but had saved him \$156 in coal bills during the first two months.

WATER SUPPLY

Water Plant Out of Debt

Kenosha, Wis.—The last cent of indebtedness on the Kenosha water plant has been paid and the trust deed, which had been given by the city in 1895, to insure the payment of the bonded indebtedness of the municipal plant, was discharged. The plant is now entirely free from debt and has a balance of \$20,000 in the bank. The original bond issue amounted to \$140,000, and in addition to paying off all of the bonds the value of the plant has been more than quadrupled in the fifteen years. It is declared that the water plant in Kenosha is the most successfully operated municipal plant in the United States.

Watershed May be Purchased

Waterbury, Conn.—Members of the Board of Works are giving consideration to the acquisition of a considerable watershed in Prospect, where it is the ultimate intention of the city officials having the matter in charge to locate a reserve reservoir, which shall prove auxiliary to the East Mountain and Prospect reservoirs, should it seem best to the Board of Aldermen. These now furnish the main source of the water supply of the high service section of the city. The capacity of the proposed reservoir is said to be double that of the East Mountain supply, which at its best is nothing to boast of, and the water is of the best quality. Should this watershed be secured at a moderate price it could be kept in reserve and utilized when the city needs it. If it should be secured by another city that section would never be available for Waterbury, however great the need. It is probable that the purchase will be considered at an early date by the Board of Works.

Geyser in the Street

Buffalo, N. Y.—A 12-inch water main burst one day last week at Seneca and Chicago streets. The trouble was first evident when the pavement was disrupted and the water began to well into the street. As it gathered headway the asphalt was torn apart and the cobbles of the stone pavement were washed out. The alarm was telephoned to the Water Bureau and two repair wagons were sent to the scene with a crew of men. The workmen on the first wagon sized up the seriousness of the break immediately and telephoned the Water Bureau and the whole available force of repair men were ordered on the job. The repairing job was by no means an easy task. The men have encountered worse breaks, but never one in so difficult a position. The broken pipe is about seventeen years old. Foreman Taughran said: "You can never tell about water pipe. Sometimes the best casting will burst in a year, while pipe that an expert would class as poor quality will last for years and years."

Propose Fine for Water Wasters

Denison, Tex.—At a meeting of the City Council last week City Attorney Decker was ordered to draw an ordinance providing for a fine of not more than \$100 to be assessed against any water user convicted of willfully wasting water. Superintendent Berry, of the Water Department, reported to the Council that he had reason to believe that some water consumers were sprinkling lawns and otherwise using water in a manner not justified by the existing state of the water supply. Hence the ordinance referred to above.

Water Waste Survey Is Started

Milwaukee, Wis.—An investigation of water waste, involving a study of the efficiency of operation of the Water Works Department, was begun by Consulting Engineers Ray Palmer and W. R. Brown. The investigation is under the direction of the Bureau of Economy and Efficiency, on request of the Commissioner of Public Works. It will probably take the entire summer, and the cost will be met from a fund of \$5,000 set aside by the Council. Ray Palmer, who is in charge, will take up as his particular lines the plant efficiency and electrolysis surveys. He is consulting engineer for some of the largest manufacturing concerns in Chicago and has had extensive experience in electrolysis work. W. R. Brown, who has direct charge of the water wastes survey, is a division engineer of Chicago, where he conducted a successful water wastes survey.

Reservoir Chemically Cleaned to Receive Filtered Water

Cohoes, N. Y.—Reservoir No. 2, of the Cohoes water supply system, has been completely drained in order that the basin may be cleaned. The walls and bed of the reservoir will be subjected to chemical treatment and later the large lake will be made the storage basin for the filtered water which will be sent through the mains to the lower or eastern section of the city. The big standpipe at the new filtering plant will hold the water for the consumers of the hill district.

Rush Work on Wells; Will Soon Be Ready

Fort Worth, Tex.—When deep wells now being drilled and others planned are completed the city's daily supply of artesian water will be increased at least 2,000,000 gallons. Two deep wells with a capacity of 500 gallons a minute have been sunk 1,100 feet through stone and dirt to the Trinity water-bearing sands. These new deep wells are located on the Cobb tract, near the Cobb Brick Works. In the same vicinity a new shallow well is being sunk to a strata known in the geological survey of the county as the Paluxy sands. Five hundred feet of boring will be necessary to strike water for the shallow well. "These two new deep wells and the shallow well should be playing a part in the daily water supply by the first of next month," said Water Commissioner Powell last week. "The work of assembling a plant is now under way and barring breakdowns or unlooked-for accidents it will be working in about two weeks. It is our intention to sink three additional deep wells to the Trinity sands for artesian water. When that is done the daily supply should be increased by more than 2,000,000 gallons. That, at least, is the extra yield upon which we are now figuring. I am unable to say when the mains of the city will be entirely free of river water, but I hope such a condition will prevail within two weeks, and feel safe in saying that the mains will carry nothing but artesian water by July 1."

STREET LIGHTING AND POWER

Favor Licenses for Electricians

Madison, Wis.—The Senate has passed a bill authorizing the city of Milwaukee to license persons, firms and corporations engaged in the installing of wires for electric lights and power in buildings, the annual license fee to be from \$25 to \$50. The Senate also passed a bill prohibiting the wiring of buildings for electric light and power in Milwaukee without a permit from the City Building Inspector.

City Gets \$3,425 as Lighting Rebates

Woonsocket, R. I.—Chairman Charles H. Cabana and his associates on the joint standing committee on street lights are being warmly and justly complimented and congratulated by taxpayers and city officials because of the advantageous settlement that they secured of this city's claim for alleged poor lighting during an experimental period of eighteen months ending in May of last year, when the present lights were substituted for the ones that the Woonsocket Electric Light and Power Company had been operating here after the arc lights had been discarded. The committee and Alfred W. Townsend, the lighting company's general manager, terminated the series of conferences that they had been holding by making an agreement whereby the company will pay the city \$3,425, and cancel about \$800 in bills upon receiving from the city a properly executed release of all claims because of alleged poor lighting under consideration.

Will Employ Expert to Determine Use of Conduits

Los Angeles, Cal.—In order to determine the city's policy with respect to the occupation of the streets with manholes and other underground chambers by the utility corporations, the Board of Public Works will ask the City Council to appropriate a sum sufficient to engage K. B. Miller, an expert engineer from Chicago, to outline a plan to be followed. Mr. Miller has been assisting the Board of Public Utilities in gathering data on which to fix the telephone rates. He is especially conversant with telephone work, and as the principal difficulty at present is with the phone companies, the Board believes he would be an excellent man for the job.

Cluster System May Be Ready Before Winter

Columbus, O.—With 400 candlepower to a standard and 4,000 to a block, the cluster lighting system, which is soon to be installed on several of the principal streets of Columbus, will give 25 per cent better light than is now afforded by the clusters on Main street, and 250 per cent more than that which emanates from the present system of arches, say its promoters. The lamps to be used on a standard will number five each, with 80 candlepower to each 100-watt tungsten globe. This makes 100 more candlepower to a standard than the system now in vogue in the Hub district, and will increase by 2,400 candlepower the light of every block on High street under the present system of illumination. There will be 860 such standards in use under the present plan of the system, according to a statement made by Service Director Harry S. Holton. Work on the installation of the clusters ought to begin, he added, by August 15, if no unusual delays are encountered.

Start Municipal Plant

Porterville, Cal.—Work was started on probably the first co-operative electric power plant in California, when ground was broken for the raceway of the plant for the Tulare Power Company on the upper Tule River. This plant is financed by the dairymen and orange growers, who are power users. C. H. Holley is in charge of the construction work and water rights sufficient to develop 7,500 electric horsepower have been located.

Town Celebrates Installation of Cluster Lights

Hamilton, O.—The inauguration of the cluster electric lighting system in the business center of the city last week was a brilliant success and marks a material advancement in the city's progress. The movement was started some time ago, was supported by the Chamber of Commerce and City Council and met with the co-operation of the Retail Merchants' Association, which took an active interest in the matter and carried it through to a final and successful consummation. Much credit for the opening of the cluster light system in Hamilton must be given to Superintendent James O'Toole, of the Municipal Electric Light Plant. Mr. O'Toole personally took charge of the work of installing the new system.

Company Offers Lower Rate to Stop Municipal Plant

North Yakima, Wash.—Rates for electric light which it is willing to offer the people of North Yakima have been announced by the Pacific Light and Power Company. The reduction is to 12 cents a kilowatt hour for small consumers and 8 cents for large consumers. The officers state that next year the rate would be cut down to 11 cents and in 1913 to 10 cents. On their part, however, the officers of the power company want the city to abandon its plan of a municipal lighting plant. After a meeting lasting two hours and a half, in which city officials and business men expressed their opinion, the Pacific Light and Power Company was asked to submit its proposition in writing and a further meeting between its officials and the City Council was arranged. President Guy W. Talbot, Vice-President A. S. Grenier and other officials of the company were here from Portland for the meeting. Mayor Schott some weeks ago filed on a water right in the Yakima River for the city and the City Engineer was instructed to make estimates of the cost of a water and light plant. It was hoped that the power company would give a 10-cent rate here, in which event the municipal plant idea would have been postponed, since the city is anxious to bond itself for a trunk sewer which will cost some \$200,000 or more.

Improve City by Removing Poles

Portland, Ind.—Superintendent B. W. Sissell, of the Portland light plant, and his men are now engaged in taking from the streets throughout the entire west part of the city the electric light poles and wires and transferring them to the alleys. The work is being pushed as rapidly as possible without interference with the service. It is said that aside from improving the appearance of the street, the change will benefit the service in removing the wires to a great extent from possible contact with others belonging to the telephone company.

FIRE AND POLICE**Pleased with the New Police Signal System**

Buffalo, N. Y.—Mayor Fuhrmann, Commissioner Zeller, Superintendent Regan and other city officials witnessed a test of the new police signal system installed at the Pearl street station. The inventor explained the working of the new system. The feature is that it keeps the station house and the patrolmen on the beat in close touch at all times. A call was sent out to one of the signal boxes at Clinton and Oak streets. Ten seconds after the bell sounded a policeman on that beat was in communication with the desk sergeant at the station house. Mayor Fuhrmann and Commissioner Zeller expressed themselves as well pleased with the working of the new system.

Motor Cycles for Patrol Duty

Lynn, Mass.—The motor cycles which will be used for patrolling the outskirts of the city, especially in East Lynn and West Lynn, have been purchased for the Police Department by Purchasing Agent Carleton. The cycles are two-cylinder, five-horsepower and will be put in commission next week, when Mayor Connery and Chief Burckes decide which officers shall operate them.

Officials Visit Neighboring City to Inspect Apparatus

Lawrence, Mass.—Mayor Edward Smith, City Clerk Arthur Phinney, Fire Chief Lane and Aldermen Morgan, Clough and Barry, of Manchester, N. H., visited the city one day last week en route to Boston while on a tour of inspection to look over some ladder trucks which the Manchester department intends to buy. The "Queen City" delegation of city officials arrived in Lawrence shortly after 9 o'clock a. m., and went to the central fire station on Lowell street, being accompanied by City Clerk E. J. Wade, of this city. Fire Chief Carey joined the party and directed the visiting city fathers to the Franklin street engine house, where a ladder truck similar to the one wanted by the city of Manchester was viewed. The out-of-town party then continued on its journey to Boston in an automobile.

GOVERNMENT AND FINANCE**Mayor Cuts Own Salary**

Springfield, O.—Taxation affairs, which have caused no end of discussion in Ohio city governments for the last few months, owing to the passage of the Smith 1 per cent tax law, have come to a climax in Springfield with the announcement by Mayor C. J. Bowlus that he has cut his salary almost in half in order to have this city proceed with the many public improvements planned here. Mayor Bowlus has been receiving \$2,500 a year, but now announces that he has decided that \$1,500 will be enough for him to live on. He also makes the statement that he does not expect to be the only official here who will chop his salary. This announcement has caused an alarm among the county officials, all of whom say they will not cut their salaries even though the Mayor should choose to cut his out altogether. Mayor Bowlus has called a meeting at which this question will be talked over in plain words. He says the officials must cut their salaries at least one-third.

Municipal Tangle in Oklahoma City Settled by Court

Oklahoma City, Okla.—The commission form of government adopted by Oklahoma City is constitutional and the election under the laws of the State was properly held, was the substance of the decision of the Supreme Court, acting on the Oklahoma City charter. That the people have an inherent right to form whatever form of government they desire as long as it is not in conflict with the Federal Constitution, was the holding of the higher court. With the announcement of the stand taken by the Supreme Court, old officials at the City Hall, who have fought the new charter form since others than they were elected to the offices, gave way to the new regime and announced they were ready to abide by the decision of the court. The first thing Mayor Whit M. Grant did after taking his office was to sign salary warrants totaling more than \$8,000. These had accumulated.

Women to Have Vote on Buying Water Plant

Des Moines, Ia.—The question of the right of women to vote on the proposition of the purchase of the water works by the city has been raised. The best authority is that the women have the right to vote on the question. Asked by newspaper men whether the women could vote at the special election June 19, when this question will be decided, Special Counsel Lees, of Attorney General Cosson's office, said he thought they could. Section 1131 of the code of 1907 provides:

The right of any citizen to vote at any city, town or school election on the question of issuing bonds for municipal or school purposes and for the purpose of borrowing money or on the question of increasing the tax levy, shall not be denied or abridged on account of sex.

It is the belief of Mr. Lees and others who were consulted that this section of the code enables the women of Des Moines to vote on the question. The law above quoted was passed by the Twenty-fifth General Assembly.

Proposes Northwest Civic League

Tacoma, Wash.—The formation of a Northwest Civic Improvement Association was proposed by Mayor Seymour at an informal gathering of Mayors of various Northwestern cities, held at the Rainier Club at Seattle one evening last week. The meeting of Mayors was due to the action of Mayor Seymour, who conceived the idea of discussing with the heads of other cities various municipal problems. Behind the meeting, however, is the larger civic project, which Mayor Seymour said he expected to see developed at a second meeting of the Mayors next Fall. A civic association as contemplated by the Mayor embraces all the cities of the State and Northwest, including Victoria and Vancouver, B. C. Its chief object, he explained, is the holding of annual conventions of several days' duration for the discussion of problems affecting the welfare of cities. Besides the officials of various cities included as members, anybody interested in the advancement and solution of the problems of cities will be eligible to membership.

Transfer City Funds

Tacoma, Wash.—Formal transfer of \$128,989.70 from the various city funds to the light and water fund in payment of old light and water bills was made by the City Treasurer during May by Commissioner Freeland of the Department of Finance. The Light and Water Department, however, had to refund to the general fund \$110,583.26, the amount representing the interest the city has paid on bonds of the department, as follows: Gravity water system bonds, \$99,125; power plant bonds, \$11,458.26. The interest for the water bonds covered the period between May, 1910, and May, 1911, while the other interest included the period from June, 1910, to April, 1911. During the year ending May 1, 1911, the city used \$56,590 worth of water and \$72,399.70 worth of light, but until last month the Light and Water Department had never been credited with those sales to the city.

Atlanta Wants a Commission

Atlanta, Ga.—Steps toward establishment of a commission form of government for Atlanta were taken recently when at a meeting of citizens it was decided to petition the Legislature to pass laws necessary to hold an election on the question. The Legislature will convene this month. It was declared at the meeting that the desire for a change in municipal administration was not due to any actions of city officials, but to the so-called obsolete city charter.

Bayonne Votes "No" on Commission Rule

Bayonne, N. J.—The attempt to end the present form of government of Bayonne, N. J., and substitute therefor government by commission, under the act passed by the last Legislature at the behest of Governor Wilson, failed after a spirited election last week by just two votes. There were 2,234 votes cast in favor of the plan to 2,236 against it. In the Fourth District of the First Ward the Election Board threw out two ballots because they were marked wrongly. No one knew if these two votes were for or against the reform method of government. The Hudson County Board of Elections will hold an official count in about two weeks, and if the two rejected ballots are counted for the commission plan the election will have resulted in a tie. In this event another election will probably be held.

STREET CLEANING AND REFUSE DISPOSAL

Municipal Garbage Collection

Duluth, Minn.—For some time the city has been experimenting with municipal garbage collection. The experiment has demonstrated these essential facts: That city garbage collection is cleaner and better and more thorough than private garbage collection; that it gives the city a better chance to see to it that all garbage is properly cared for; that the city can do it as cheap as, if not cheaper than, individuals, as well as better, and that it can be done not only without cost to the city, but actually at a profit. The one garbage wagon operated by the city in the downtown district has not only paid its way, but in one year has practically repaid the original cost of horse and wagon out of profits.

Cost \$895.20 for Municipal Clean-Up

Erie, Pa.—Superintendent of Streets John O'Hagan reported to Mayor Liebel last week that the cost of cleaning up the rubbish on municipal cleaning day was \$895.20. The work took four days with every available team working. The average cost per load was 92 cents for 974 loads. The Mayor has figured out that by the city doing the work the property owners were saved at least \$5,000 from what they would have had to pay draymen. Money for the team work comes from the ward funds by appropriation of councils.

Praises City Cleaning

Toledo, O.—Recognizing the beneficial results of the civic housecleaning conducted May 1 by the Civic Federation of the Commerce Club, Service Director John R. Cowell has communicated with the officers of the federation confirming the report that the city has decided to maintain a daily clean-up and requesting the federation's moral support.

RAPID TRANSIT

Municipal Railroad to Coyote Point Favored

San Mateo, Cal.—A movement was started at a meeting of the San Mateo board of trustees for a municipally owned railroad from San Mateo to Coyote Point, on San Francisco Bay, about a mile and a half from the center of San Francisco. It is also planned to construct a municipal wharf for the purpose of establishing a ferry service between San Francisco and San Mateo. Davenport Bromfield was asked to estimate the cost of the wharf and railroad.

Special Street Car Committee Submits Report

Jacksonville, Fla.—After practically three months of patient waiting the special committee from the City Council and citizens at large, appointed to investigate and make certain recommendations regarding the street railway service in this city, presented its report at a meeting of the City Council last week, said report digging deeply into defects alleged to be existing at present and making preparations to avoid any defects which might exist in the future. The report was quite exhaustive, embracing an entire library of manuscript, and recommending everything that could be imagined to make a street railway system absolutely ideal. Following the reading of the report various members of the council made brief talks and a full discussion of the committee's findings was indulged in. Many motions in regard to the disposition of the report were made, all of which were killed finally and a further motion, offered by Councilman Holt, providing for the publication of the report in the daily papers, and an additional supply of 300 copies for distribution from the office of the city recorder, prevailed.

New Street Car Line Rumor

Denison, Tex.—While the plans or the names of the people interested have not been made public there is a well-defined movement on foot to build a second street railway in the city, according to a prominent citizen who declined to allow his name to be used in connection with the reports. According to his statements capitalists from Ohio have made two trips of inspection over the city of Denison. The streets and avenues of the city have been gone over as late as last week by men who represent ample capital and who have made the construction and maintenance of street and interurban railways their specialty.

MISCELLANEOUS

Plan Deeper Channel for Providence River

Providence, R. I.—Proposition of a 30-foot channel for Providence River and Narragansett Bay is a matter of much consideration at the present time, Representative George H. Utter having had frequent consultations with the officials of the War Department for the purpose of hastening the report on the examination and survey of Providence River and Harbor. Mr. Utter is very desirous of having the examination and survey completed as soon as possible so that the report may be considered by Congress at once. Mr. Utter has sent a communication to the United States Engineer at Newport, who is in charge of this survey, asking for information as to the exact scope the examination and survey is taking, with a view of introducing a resolution in Congress asking for additional authorization if it is found necessary.

City Plan Commission Is Called Together

Newark, N. J.—At the suggestion of City Clerk Connelly, David Grotta, whose name headed the list of nine appointed to the city plan commission by Mayor Haussling last week, has issued a call for a meeting of the commission. At that time the members will be sworn in and will effect organization. Under the bill creating the commission, which was passed by the last Legislature, it will have power to employ experts to confer as to methods of beautifying the city and developing the community along a general scheme that will bring out all that is best in the city's improvement. The sum of \$10,000 is allowed to the commissioners to spend in a single year, they themselves serving without compensation.

City Adopts Municipal Flag

Indianapolis, Ind.—A municipal pennant has been adopted by the Municipal Flag Commission, recently appointed by Mayor Shank, and the pennant has been approved by the Mayor, and will become the official emblem of the city of Indianapolis. Hereafter Old Glory will share honors with the city's emblem in front of the City Hall Building. The new pennant also will be used in demonstrations by the city and by civic and commercial bodies. The new pennant, which was designed by Dr. William H. Johnson, of the City Council, has a blue field, and, as indicated in the ac-



companying illustration, in the upper left-hand corner is a large, five-pointed star, representing the executive department. Around the large star, in crescent shape, are nine smaller stars, representing the City Council, which is composed of nine members. At the right hand is the city's seal, representing the legal department and below the seal is a conventional wreath. The stars, seal and wreath are in gold. It is likely the new pennant will be seen in public the first time the Fourth of July, when the emblem will appear in the parade of school children that is being arranged by the Commercial Club.

Appoint Charities Commission to Stop Street Begging

Spokane, Wash.—Arrest and fine or imprisonment will be the lot of any person soliciting funds for charitable purposes without a certificate from Mayor Hindley's charities commission, according to the Mayor's preliminary draft of his proposed ordinance which is now in the hands of the

city legal department to be put in formal shape for submission to the council. The legal department has been instructed to shape the bill to provide for a commission of six members to serve without pay, two members to be appointed with the approval of the City Council every year. The ordinance will provide for an appropriation of \$1,800 for the salary of a permanent secretary and office expenses. "It is now against the law for an individual to solicit funds for himself, which is begging," says the Mayor. "If the measure passes soliciting or begging for others will also be unlawful unless the commission has passed on the worthiness of the cause being solicited for. While the ordinance provides only for the certification plan the commission will be allowed to draw up its own rules and regulations and there is nothing to prevent it from doing charity work itself, supervising the charities of the city and conducting such investigation as it may see fit."

Advertisements on Sprinkling Carts

Ottawa, Can.—That its water carts should spread information as well as water is an idea that has appealed to Ottawa. That city's waterworks committee heard Commissioner Baker of the publicity bureau state the advantages of placing advertising on the water carts, and it was decided to recommend that the idea be adopted, so far as two of the carts are concerned. The wording suggested was as follows: "You are in the chief power city of Canada. Get maps and all information at the publicity and industrial bureau."

Up-to-Date Apparatus Meets Approval of Expert

Dallas, Tex.—The interest in playgrounds for children received a stimulus in the visit of Dr. Henry S. Curtis, who visited Dallas to conduct an educational campaign in behalf of the local playground movement. The value of playgrounds as a means for the proper physical development of the child and the conservation of its health was the general theme of one of his talks. Dr. Curtis stated that when the playgrounds were first started the general thought in the



Courtesy Dallas News.

ENJOYING THE FLYING RINGS

minds of the people was that the purpose of the playground was to keep the children off the streets. To-day they have come to see that the playground has a specific training to give, which is no less definite and perhaps no less important than the training of the school itself. The child to-day gets practically all of his physical strength from his play. Fifty years ago he was getting strong from the work he did, but to-day the work of the city boys has disappeared. Dr. Curtis inspected the playgrounds, which are in full operation, and was much pleased with the up-to-date apparatus.

To Study Chicago Parks

Indianapolis, Ind.—A number of city officials will go to Chicago to study the park and boulevard system of that city. Those who will make the trip are Mayor Shank, Dr. Henry Jameson, John J. Appel and Charles E. Coffin, of the board of park commissioners; Elmer W. Stout, attorney, and Daniel Deupree, engineer for the board; all the members of the City Council except Frank E. McCarthy; Herman Munk, of the board's real estate advisory committee, and Henry W. Klausmann, city engineer; George E. Kessler, the park board's landscape architect, will join the party in Chicago. Expenses of the trip will be borne by individual members of the park board.

LEGAL NEWS

A Summary and Notes of Recent Decisions—Rulings of Interest to Municipalities

Change of Grade—Damages

City of Rawlins vs. Murphy et al.—In an action against a city for damages to abutting property caused by changing the grade of two streets on a finding that one of the streets was not a public highway, it was not error to segregate the damages, and allow recovery on account of the other street.—Supreme Court of Wyoming, 115 P. R., 436.

Negligence of Subcontractor—Liability of City

McNamara vs. City of New York et al.—Defendant city contracted for the construction of a viaduct, and the contractor subcontracted the steel construction work. Plaintiff was injured while walking under the viaduct, while the steel work was being painted by the subcontractor, by an employee letting a piece of plank used as a scaffold in painting fall upon him. Held that, since the work of painting was not inherently dangerous, the city was not liable for the injuries which were caused by the negligence of the subcontractor's workman, either under the doctrine of respondent superior or otherwise.—Supreme Court of New York, 129 N. Y. S. 230.

Defective Sidewalks—Ice

Barker vs. City of Jefferson.—A city permitting snow and ice frozen together to form in ridge across a walk so as to be dangerous to pedestrians and to remain long enough for it to know of the conditions and remove the danger, is liable for injuries to a pedestrian caused thereby. A city must keep its streets reasonably safe for travel; and the fact that it cannot enforce penalties against abutting owners failing to remove dangerous obstructions to travel does not absolve it from the performance of its duty.—Kansas City (Mo.) Court of Appeals, 137 S. W. R., 10.

Police Judges—Salaries—Statutory Provisions

Holman vs. City of Macon.—Revised Statutes provides for the election of police judges. A section empowers the city council to fix the compensation of all officers of the city. A city passed an ordinance that, in addition to the fees allowed by law to the city officers, a salary of \$240 per annum should be paid to the police judge from the common or other fund as may be provided for that purpose. Other ordinances relate to the assessment, collection and disposition of the police court fees, and provide that all fees, costs and fines in proceedings had in such court should be collected by the Marshal, and paid to the police judge's court fund of the city treasury. Held, that the ordinances give no other compensation to the police judge than the salary provided.—Kansas City (Mo.) Court of Appeals, 137 S. W. R., 15.

Invalid Franchise

Monett Electric Light, Power & Ice Company vs. Incorporated City of Monett, Mo., et al.—A city having power to grant an exclusive franchise to an electric light company for a term of years undertook to do so by an ordinance which was void because not passed in conformity to law. The grantee accepted the ordinance, built a plant, and furnished light and power to the city and its inhabitants for the greater part of the term, receiving payment therefor. Held, that the fact that the contract had been performed for such length of time did not render it valid nor give the company the right to enforce it in equity for the remainder of the term.—United States Circuit Court, 186 F. R., 358.

Acquisition of Highway—Abandonment

Valentine Blatz Brewing Company vs. City of Milwaukee et al.—Where a highway is laid out by a municipality or by dedication, and the municipality for more than twenty years opens and uses a strip of land of the same width as such highway, which strip by mistake does not coincide with the lines of the highway laid out, the city acquires the right to use that particular strip for its highway, and abandons the part of the laid out way not included within the strip actually used.—Supreme Court of Wisconsin, 131 N. W. R., 416.

Personal Injuries—Contributory Negligence

Mastin v. City of New York.—Plaintiff, a photographer, who while standing on the curb of a street covered his head with a focusing cloth, and remained thus blinded for five minutes, when he was struck by defendant city's ash cart, was as a matter of law guilty of contributory negligence.—Court of Appeals of New York, 94 N. E. R., 611.

Changing Grade of Street—Liability

Dickerson v. Town of Okolona.—Constitution declares that private property shall not be taken or damaged for public use without just compensation therefor. Kirby's Digest provides that, where a municipal corporation shall be liable for damages to the owner of grounds by the grading of streets, the damages shall be assessed by three disinterested freeholders of the city. A section provides that if a person shall neglect or refuse to accept the amount so assessed, and shall prosecute the municipality and not recover more than the amount allowed by the assessors, he shall pay all costs, and that no claimant for damages shall bring suit until he shall have filed a claim for greater damages with the city clerk within a certain time, and that no suit shall be commenced until after the assessors shall have been appointed and made return of their assessment as provided, nor for 30 days thereafter. Held, that the owner of abutting property may recover from a city for damages thereto from raising or lowering the grade of a street where the damages are direct and peculiar to such property, and not such as are shared by the general public, and the remedy prescribed by the statute is not exclusive, but suit may be brought for such damages where the municipality fails and neglects to appoint an arbitrator as required by the statute.—Supreme Court of Arkansas, 135 S. W. R., 83.

Change of Grade of Street—Damages

Milwaukee Trust Company vs. City of Milwaukee.—Milwaukee city charter entitles the owner of land affected or injured by the alteration of the grade of a street theretofore graded to the former established grade to compensation, and provides that such damages and the costs of improvements as provided and the changing of the grade of any street shall be considered and allowed in assessing benefits and damages because of the street improvement, and, if the damages exceed the benefits, the excess shall be paid out of ward funds unless waived, and a section provides for appeal to the Circuit Court from such assessment as confirmed by the Common Council. Held, that the city is liable to an abutting owner for the damages in excess of benefits resulting from an alteration of grade; the same being recoverable on appeal to the Circuit Court in an improvement proceeding.—Supreme Court of Wisconsin, 131 N. W. R., 439.

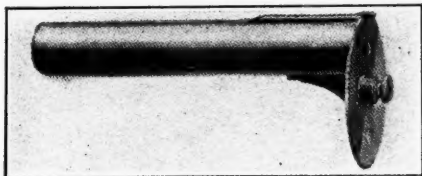
Illegal Expenditures—Recovery

Village of Reed City vs. Reed City Veneer & Panel Works.—The complaint alleged that certain persons, representing themselves as the finance committee of the plaintiff village, executed a contract with defendant, by which the village agreed to purchase property and erect buildings costing \$10,000, and convey it to defendant in consideration of its operating certain manufacturing works therein, employing a certain number of laborers, that the purpose of the contract was to give defendant a \$10,000 bonus without consideration, and that the village purchased realty with village funds for \$4,000 and advanced \$6,000 for erecting a building; that the building was used for manufacturing purposes until destroyed by fire, and a draft representing the proceeds of an insurance policy, payable to the village as its interest might appear, was delivered to defendant and deposited in bank for a certificate of deposit payable to defendant and the village, and the prayer was that the validity of the contract, complainant's rights to the machinery, buildings, etc., and to the proceeds of the policy be determined, and that defendant be required to indorse the certificate of deposit to complainant and pay the difference between it and the \$6,000 advanced. Held, that the complaint was framed on the theory of pursuing and recovering money unlawfully taken from the village treasury and traced into the realty described and the bank deposit, and not to enforce the invalid contract, and was not demurrable.—Supreme Court of Michigan, 131 N. W. R., 385.

MUNICIPAL APPLIANCES

Smoke Meter

THE Kunze smoke meter, invented by Edward J. Kunze, East Lansing, Mich., shown in the illustration, consists of a metal tube 6 inches long and one inch in diameter, at the end of which is a disc of transparent celluloid. Four tints are employed—grades 1, 2, 3 and 4 of the Ringelmann chart. Grades 0 and 5 are omitted, as anything lighter than 1 may be regarded as zero and anything darker than 5 may be called black, without any appreciable error so far as the work of a smoke inspector, for whose use the instrument is intended, is concerned. Grades 3 and 4 are most vital, as they constitute a violation of most municipal smoke ordinances. In the center of the tints as shown on the disk are small holes.



KUNZE DEVICE FOR COMPARING DENSITY OF SMOKE.

The observer looks through the instrument with one eye closed. The smoke is seen through the small hole in the center of the colored spot on the disk and an exact comparison can be made with the color of the spot as there is no disturbing influence. In operation the disk is revolved until the shade of the smoke corresponds to one of the tints on the disk, or most nearly to it. If the smoke is darker than the surrounding tint a dark spot will appear in the center. If the smoke is lighter, the spot will appear quite light in comparison. The contrast is great until the shades correspond to one another, at which time the contrast suddenly ceases to exist and the tint at the end of the tube is unbroken.

The disks are best tinted by photography, but they may be painted. Spots are painted on cardboard corresponding to the desired tints. This is then photographed and printed on a sensitized celluloid disk. By using an electric light for printing uniform grades can be secured for any number of prints. The celluloid disk may be further protected by a glass disk, its edge being protected by a rim of celluloid.

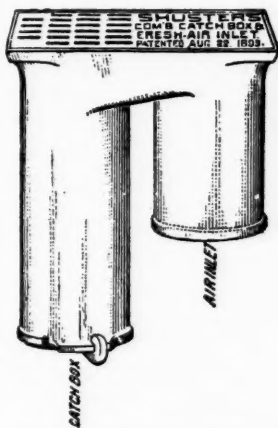
Chlorination Plant for the Disinfection of Water Supplies

The New Jersey Security Company, Paterson, N. J., has placed on the market a plant for mixing calcium hypochlorite with drinking water. The outfit, which was planned by Dr. Leal, may be used either as an emergency plant, its capacity being sufficient for any purpose, or it may be used as a permanent installation. The plant works most conveniently in treating 10,000,000 gallons of water a day, but of course may be used to treat less as well as more. An upright steam engine requiring little floor space is furnished to turn the paddles in the large tanks and operate the device for feeding the chemical. The tanks are of steel and may be lined with a noncorrosive coat-

ing if required. There are two porcelain lined orifice regulating boxes. The depth of the solution is regulated by a flat valve and the orifice is protected by a screen. The regulated and controlled quantity of hypochlorite, generally about 2 per cent, then passes by pipes to the point where it is desired to add the solution to the water supply.

Vent and Catch Box

The Shuster Plumbing Supply Company, northeast corner of Franklin and Willow Streets, Philadelphia, Pa., manufacture a combination vent and catch box, shown in the illustration. The vent is for use as an air inlet to a house drainage system and is ordinarily set in the sidewalk or lawn, where, if there is no means provided for keeping out the dirt, it is apt to fill up and render the ventilating system useless. In the Shuster vent, the

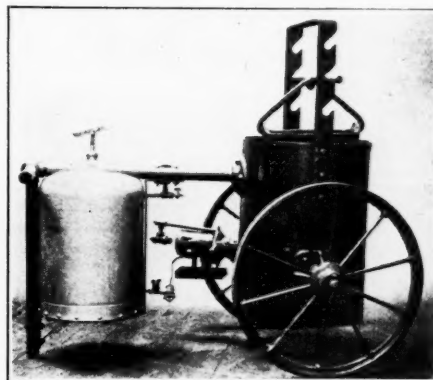


COMBINED CATCH BOX AND FRESH AIR INLET.

air pipe to the sewer is offset. Half of the cover is perforated and under the perforated section is the catch box.

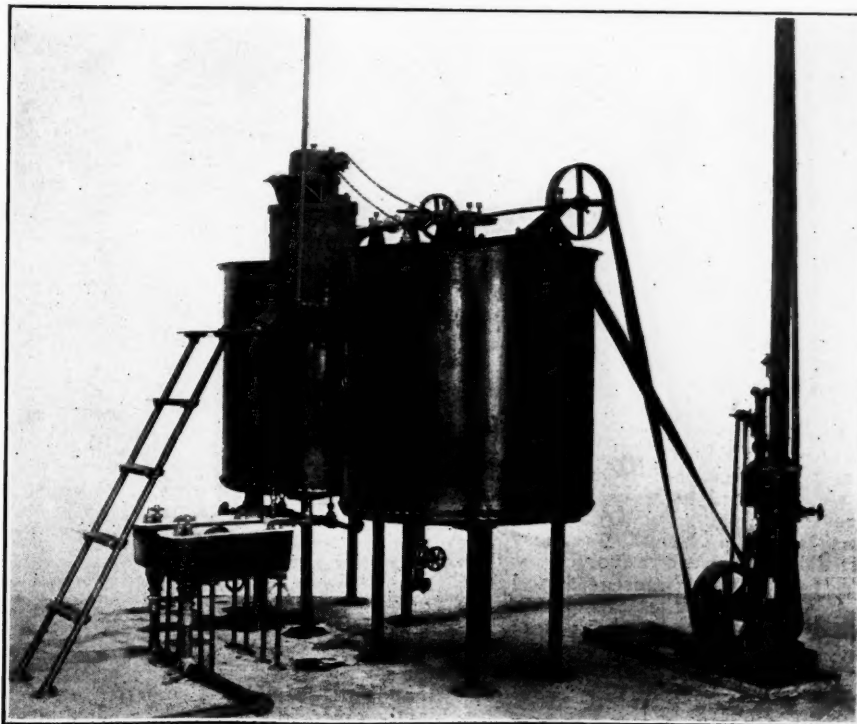
Portable Lead Furnace Using Kerosene as Fuel

THE Hauck Manufacturing Company, 140 Livingston street, Brooklyn, N. Y., who are specialists in the manufacture of kerosene torches and oil burning appliances, manufacture a portable lead melting furnace shown in the illustration. The burners attached to the furnace are of the compressed air type. The air tank is carried firmly on a framework connecting the lead pot with a leg on which the outfit rests when not being moved about. The air



LEAD FURNACE.

pump is of the direct piston type, no troublesome levers to get out of order. An air gauge is provided, as well as necessary valves for air and oil. The furnace wheels are made of steel with wide rims. A convenient rack over the furnace allows the melting pot to be held at such height as is desired. These melting furnaces are made in three sizes—13½-inch diameter, 6¾ inches deep, capacity 200 pounds; 15-inch diameter, 11 inches deep, capacity 450 pounds, and 18-inch diameter, 13 inches deep, capacity 850 pounds. The Hauck kerosene burner produces a clear flame and eliminates the dangers of gasoline explosions.



PLANT FOR MIXING HYPOCHLORITE LIME WITH WATER.

NEWS OF THE SOCIETIES

International Association of Chiefs of Police.—The eighteenth annual convention was held at Rochester, N. Y., June 13-16. Major Richard Sylvester, Superintendent of Police, Washington, D. C., president of the association for the past ten years, presided. Mayor Hiram H. Edgerton made the address of welcome, expressing the hope that the members would have time to look at the beautiful homes and parks of Rochester. Major Sylvester replied. He then invited Chief W. S. Seavey, Seattle, Wash., to take a seat on the platform. Chief Seavey, while chief at Omaha, conceived the idea and took the first steps toward the formation of a police association. In his annual address Major Sylvester spoke of the value of the association. He said an identification bureau acted as a deterrent to crime, but there was no general bureau. In the United States 134 cities use the Bertillon system and 69 the system of identification by finger prints, but of these 64 also used the Bertillon system, so that there are really 169 departments which used identification systems. Major Sylvester spoke of the immigration criminal situation and referred to many of the problems which confront the chief in the performance of his duty.

On Wednesday, the second day of the convention, John B. Taylor, Superintendent of Police, Philadelphia, Pa., read the report of the National Bureau of Criminal Identification. He said that nearly 10,000 new descriptions were added during the past year, 719 identifications were made and nearly 14,000 letters were written. Arrangements are being made to install the finger print system on July 1.

President Sylvester read communications from a number of police chiefs of foreign countries, including the Prefect of Police, Paris; the Commissioner of Police, Vienna; the Chief Constable of Glasgow; the Inspector General of Police of New South Wales and chiefs of a number of South American cities.

Chief William Young, St. Louis, read a paper, in which he referred to the development of the police system of getting evidence. Superintendent of Police John B. Taylor, Philadelphia, read a paper on the carrying of concealed weapons, which he considered as one of the most important questions of the day. Federal and State constitutional provisions giving citizens the right to bear weapons were quoted. The carrying of concealed weapons with unlawful intent is quite another matter. When a crime is committed the police are confronted with the difficulty of tracing a weapon to its user because of lack of proper supervision of the sale of these weapons. Statistics gathered from 13 cities show how serious this condition of affairs has grown to be. There were 3848 arrests in 1909 for carrying concealed deadly weapons, and in 1910 this record grew to 3904. There were 2981 arrests in 1909 for murder, manslaughter and similar crimes committed by the use of revolvers, and in 1910 this number increased to 3172. The speaker said that laws should be passed in all States making it obligatory on all retail dealers to keep a daily record of all sales of weapons and explosives.

Joseph Rogers of the Ontario Provincial Police read the Canadian law,

which went into effect in April, regarding the carrying of weapons. He said it had met with universal favor.

Commissioner Dougherty, New York, referred to the way in which one of his men detected gun toters. He watched the pawnbrokers' offices and when a man purchased a gun he followed him outside and arrested him. A banquet was given at the Powers Hotel Wednesday evening.

On Thursday morning the session began with the reading of a paper by Chief W. E. Griffin, Kansas City, on the Relation of Police Departments to Other City Departments. He said the police department should be looked upon as the strong arm to assist all other municipal departments. He recommended having the police officer assist in taking care of the condition of the city by reporting such things as defective sidewalks, piles of rubbish, nuisances, etc. He also referred to one of his men who has the position of assistant to the unemployed, and his duty was to visit the cheap lodging houses and assist in obtaining employment for the men.

Chief Henry D. Cowles, New Haven, described the probation system in vogue in New England. He said that cheap poolrooms and like places tended to develop criminal instincts. Idleness is the mother of crime, and children should be kept busy. The results obtained by the probation law were not satisfactory. Too much sympathy with young criminals demoralized both officers and accused. The methods employed by the police years ago were more effective than those employed now.

Joshua B. Gray read a paper on Probation Laws and Their Workings. His observations were unfavorable to the work of the probation officers.

Deputy Police Commissioner George M. Dougherty, New York City, spoke of the benefits derived from the finger print system of identification as used in the New York detective bureau.

On Thursday, the final day of the session, the entire list of officers was re-elected and Toronto was selected as the next meeting place. The officers are: Major Richard Sylvester, Superintendent of Police, Washington, D. C., president; Michael Regan, Chief of Police, Buffalo, N. Y., first vice-president; Joseph M. Quigley, Chief of Police, Rochester, N. Y., second vice-president; Harvey O. Carr, Chief of Police, Grand Rapids, Mich., secretary-treasurer. As a token of their appreciation of his efforts in behalf of the association and the convention Chief Quigley was presented with a handsome engraved gold watch and chain with a diamond studded watch charm and Mrs. Quigley was presented with a pair of gold candlesticks and a gold clock.

Chief Vincent McKinnon, Superior, Wis., presented the first paper of the morning on the Juvenile Offender. He said there was no subject or field of activity on which the police are daily called to act which requires so intelligent efforts as the treatment of the juvenile offender. The criminal of to-day was the juvenile delinquent of yesterday. The speaker said that one of the grandest institutions ever devised by law is the establishment of the juvenile court. It could be much more effective, he said, if its decrees were placed in the hands of trained and experienced men and women for execution rather than as now, in many cases, in the hands of politicians.

"It is vital and imperative that our probation officers should not only be schooled in their work, but they should also have that natural inherent personality that makes for the highest degree of success in this noble and important calling, and in my judgment both the institutional and court probation officer should by statute be made civil service officers and they should be required to pass an examination testing their fitness to qualify for the work.

"Ninety-five per cent. of our juvenile offenders are normal boys and girls, and under sixteen years of age they are all plastic or corrigible and susceptible, under intelligent guidance, to influences that make for better citizenship. Mark you well, the time is coming, slowly perhaps, but surely, when this important problem will, because of its possibilities and far reaching influences, overshadow all other social and economic problems, and I trust and hope that in the vanguard in this noble work will be found every chief of police in this our beloved country."

Chief Carlos M. Aguirre of Havana, Cuba, presented a paper, which was read by President Sylvester and vigorously applauded, in which he described fully the workings of the Havana police.

President Sylvester introduced Eugene Van Buskirk, superintendent of the National Bureau of Identification, who spoke at some length on how the best results could be obtained by the subscribers to the bureau.

Chief Regan of Buffalo, invited the members to visit Buffalo and inspect a new signal system which has been installed in one precinct.

After the reading of the papers in the afternoon the party took chartered cars to Manitou Beach, where the afternoon was spent and dinner served. In the evening they went to Ontario Beach Park.

There were a number of exhibitions of police equipment in a room adjoining the convention hall. One of the best exhibits was that conducted by the Charles D. Reese Company of New York, manufacturer of badges and all sorts of police paraphernalia. Arranged at the rear of the booth are a score of pretty, tasteful police badges; on the sides Mr. Reese had hung police clubs, pocket billies, ankle irons, handcuffs, thumb cuffs, whistles, leg irons, belts, cords, tassels and straps. One of the devices that seemed to attract considerable attention from the visiting chiefs is a new bed strap device, to be used in preventing insane persons or persons afflicted with the delirium tremens from harming themselves. Mr. Reese himself was in charge of the exhibit and his class of goods attracted considerable comment. Mr. Reese manufactured the gold badges being worn by Chief Quigley and Inspector Zimmerman, and he had on exhibition several duplicate gold badges manufactured for chiefs of police of other cities.

New York State Association of Chiefs of Police.—The annual convention was held, Rochester, N. Y., June 13-16. President James W. Rynex, Chief of Police, Schenectady, in his annual address spoke of the laws pending in the State Legislature affecting the work of police departments. One of these, amending the penal law relating to assaults upon or oppression of persons under arrest, would prohibit the taking of data for purposes of identification and the questioning of prisoners

except in the presence of counsel. If passed, he said, this law would greatly hamper the work of police departments. A measure providing for the establishment of a State farm for tramps was highly commended. He recommended the organization of classes for the instruction of policemen in first aid to the injured. At the afternoon session the following officers were elected: President, Charles H. Goodrich, Binghamton; vice-president, James J. Lang, Little Falls; secretary-treasurer, James L. Hyatt, Albany, re-elected; director for three years, James Donovan, Port Chester. Binghamton was chosen as the place for next year's convention.

International Association for the Prevention of Smoke.—The convention will begin at 10 o'clock, June 28, in the council chamber of the City Hall, Newark, N. J. Mayor Haussling will deliver an address of welcome, which will be responded to by the chairman of the convention. The formalities of ascertaining the representations of active and associate members present and reports of standing committees will consume the morning session.

The afternoon session of Wednesday will be held in the board of works room, which is adapted to the use of slides for pictures. There will be an illustrated address on the subject of "Gas Producers, the Burning of Fuels Smokelessly and the Value of Briquets," by Professor R. H. Ferrald, chief engineer of the United States Geological Survey.

Another address of this session will be by James T. Whittlesey, chief engineer of the Public Service Electric Company. He will be assisted by Henry S. Vasser, assistant chief engineer of the same company. The addresses will be followed by a general discussion of the subjects.

There will be a discussion of mechanical stokers and steam jet devices, special furnaces and devices for smoke prevention and economy Wednesday night.

One session only will be held on the second day of the convention. That will be in the morning, when Dr. Ernest J. Lederle, of New York, will deliver an address on the progress of the movement for smoke prevention and regulation in that city, of which he is Health Commissioner. Richard J. Watrous, secretary of the American Civic Association, will deliver an address at this session on "Smoke vs. City Beauty."

Thursday afternoon will be devoted to entertainment. The delegates and their wives will be taken for a trip to Coney Island, with a tour of Luna Park and other amusement places and a clambake dinner at Feltman's as incidents.

The session Friday morning will begin at 9.30 o'clock. A paper on the workings of the recently enacted Ohio smoke law, prepared by State Senator John Krause, formerly smoke inspector of the city of Cleveland, will be read.

There will also be discussion relative to railroad smoke and the efforts to abate it. Representatives of the railroads and members of the association will take part in this discussion.

Other short addresses will be made on appropriate subjects, and the final session will witness the election of officers for the ensuing year, the selection of the convention city and the farewell address, which will be made by Secretary-Treasurer Richard C. Harris, of Toronto, Can. F. E. P.

Calendar of Meetings

- June 21-22.**
National Conference of Poor Law Officials.—Boston, Mass.—Dr. Robert W. Hill, President State Board of Charities, 105 East Twenty-second street, New York City.
- June 21-22.**
New York State Association of Fire Chiefs.—Annual Convention, Glens Falls, New York.—Henry R. Yates, Secretary, Schenectady, N. Y.
- June 22-24.**
Intermountain Good Roads Association.—Annual Convention, Pocatello, Ida.—Caleb Tanner, State Engineer.
- June 26-27.**
Kentucky State Firemen's Association.—Annual Convention, Covington, Ky.
- June 27-29.**
South Carolina State Firemen's Association.—Annual Convention, Columbia, S. C.—Louis Behrens, Charleston, S. C.
- June 27-29.**
Northwestern Indiana Volunteer Firemen's Association.—Annual Convention, Winchester, Ind.—Chief Guy Way, Winchester, Ind.
- June 27-July 1.**
American Society for Testing Materials.—Fourteenth Annual Meeting, Hotel Traymore, Atlantic City, N. J.—Edgar Marburg, Secretary, University of Pennsylvania, Philadelphia, Pa.
- June 28-29.**
South Carolina Water Works Association.—Meeting for Organization, Columbia, S. C.—W. F. Steiglitz, Temporary Secretary, Columbia, S. C.
- June 28-30.**
International Association for the Prevention of Smoke.—Annual Convention, Newark, N. J.—R. C. Harris, Secretary, City Hall, Toronto, Ont.
- July 3-8.**
South Dakota State Firemen's Association.—Tournament and Convention, Lead, S. D.—Charles P. Coolidge, Lead, S. D.
- July 21-23.**
Wisconsin State Firemen's Association.—Annual Convention, Fort Atkinson, Wis.
- July 25-26.**
Western New York Firemen's Association.—Convention, Springville, N. Y.
- July 25-28.**
Iowa Firemen's State Association.—Tournament, Des Moines, Ia.—N. J. Francis, Secretary, Des Moines.
- August 1-3.**
Ohio Chiefs' Association.—Convention, Cedar Point, O.—Chief, A. Hegeman, Cedar Point.
- August 15-17.**
Utah State Firemen's Association.—Convention, Provo, Utah.—C. F. Stillman, Bingham, Utah.
- August 15-18.**
Firemen's Association of the State of New York.—Rochester, N. Y.—Thos. Honohan, Secretary, Frankfort, N. Y.
- August 23-25.**
Virginia State Firemen's Association.—Convention and Tournament, Newport News.
- September 12-15.**
International Association of Municipal Electricians.—Annual Convention, St. Paul, Minn.—Clarence R. George, Secretary, Houston, Tex.
- September 18-30.**
International Municipal Congress and Exposition.—Chicago, Ill.—Curb M. Treab, Secretary, Great Northern Building, Chicago, Ill.
- September 18-October 1.**
Fourth International Good Roads Congress.—Chicago, Ill.—J. A. Rountree, Secretary, Birmingham, Ala.
- September 19-22.**
International Association of Fire Engineers.—Annual Convention, The Auditorium, Milwaukee, Wis.—James McFall, Secretary, Roanoke, Va.
- September 19-22.**
American Hospital Association.—New York City. J. N. E. Brown, M.D., Secretary, Toronto General Hospital, Can.
- September 24-30.**
International Congress on Tuberculosis.—Rome, Italy.—Professor Ascoli, Secretary-General, Via Lucina, Rome, Italy.
- September 26-29.**
American Society of Municipal Improvements.—Grand Rapids, Mich.—A. Prescott Folwell, Secretary, 239 West Thirty-ninth street, New York City.
- October 4-6.**
League of American Municipalities.—Annual Convention, Atlanta, Ga.—John MacVicar, Secretary, Des Moines, Ia.
- November 13-17.**
National Municipal League.—Annual Meeting, Richmond, Va.—Clinton Rogers Woodruff, Secretary, North American Building, Philadelphia, Pa.

PERSONALS

AGUIRRE, COL. CHARLES M., Chief of Police of Havana, Cuba, attended the police convention in Rochester last week. Colonel Aguirre, who was appointed to the command of the Havana police on March 1, has established many reforms during his three months of service and has reduced the number of monthly robberies to about one half.

AYMARD, L. G., for over four years city clerk of Pensacola, Fla., has been reappointed by Mayor Reilly, and the appointment unanimously confirmed by the city council.

BENNETT, E. H., civic architect, has prepared plans and sketches for the improvement of Portland, Ore., which were on exhibition at the recent City Planning Convention at Philadelphia, and attracted a great deal of attention. In the month of July the great development scheme is to be submitted by Mr. Bennett for the city's adoption.

BLAKE, G. IRVING, has been appointed chairman of a committee to plan for making a city beautiful of Erie, Pa. Mr. Blake, while residing in Hartford, Conn., was secretary of the city planning movement there. It is the idea of the committee to plan a system of harmonizing the parks, boulevards, grade crossings, business thoroughfares and residence avenues so that all will tend to a city beautiful.

BROWN, FRANK, former Governor of Maryland, has resigned as City Collector of Baltimore.

BROWN, COL. OSCAR, has been elected Mayor of Lulu, Ga.

CALLAGHAN, BRYAN, is the new Mayor of San Antonio, Tex.

CHRISTENBERY, DR. H. E., has been elected Mayor of Knoxville, Tenn.

CURTIS, DR. HENRY S., playground expert, has been engaged to give a course of lectures and instruction at the University summer school at Salt Lake City.

DILLON, JAMES E., has been appointed fourth deputy police commissioner of New York City under Commissioner Waldo.

FORD, FREDERIC L., of Hartford, Conn., recently delivered a lecture on City Planning at Tampa, Fla.

GAMPER, HERMAN, superintendent of the municipal light plant of Columbus, Ohio, has handed in his resignation to Mayor Marshall, to take effect on July 15, on which date he will go to Erie, Pa., to accept the superintendency of the light plant of the Erie Electric Light Co.

GOLDSBOROUGH, A. S., who for four years has been secretary to Mayor Mahool, of Baltimore, has been appointed secretary to the Factory Site Commission in that city, at a salary of \$3,000.

GROTTA, DAVID, has been elected chairman of the City Plan Commission recently appointed by Mayor Haussling, of Newark, N. J.

HOWELL, DR. HARRISON W., is the new Mayor of Wilmington, Del.

MANON, THOMAS H., an English landscape artist who is now in this country studying the rapid advancement that is being made here in altering our towns on scientific lines, has received offers from Cornell, Yale and Harvard to establish a chair of "City Planning."

SPEER, ROBERT W., Mayor of Denver, has sailed for Europe. At Boston he joined the civic party which sailed June 17 from New York to study the municipal activity of the old world. In Paris Mayor Speer will go over with Frederick McMonnies the plan for Denver's civic center, which has been approved after a long fight in the courts.

THE MUNICIPAL INDEX

In Which Are Listed and Classified by Subjects All Articles Treating of Municipal Topics Which Have Appeared During the Past Month in the Leading Periodicals

It is our purpose to give in the second issue of each month a list of all articles of any length or importance which have appeared in all the American periodicals and the leading English, French and German ones, dealing more or less directly with municipal matters. The index is kept up to date, and the month of literature covered each time will be brought up to within two or three days of publication. Our chief object in this is to keep our readers in touch with all the current literature on municipal matters. In furtherance of this we will furnish any of the articles listed in the index for the price named after each article, except that where an article is continued in two or three issues of the paper, the price given is for each of said issues. In addition to the titles, where these are not sufficiently descriptive or where the article is of sufficient importance, a brief statement of its contents is added. The length also is given, and the name of the author when it is a contributed article.

ROADS AND PAVEMENTS

Road Improvement in the South. By the U. S. Office of Public Roads. Illustrated, 8 pp., Better Roads, May. 10 cts.

Road Construction in Dade County, Florida. Illustrated, 1 p., Contractor, June 1. 20 cts.

A Modern California Highway. By P. E. Clark. 2 pp., Good Roads, May. 10 cts.

South California Roads. 1-4 pp., Municipal Journal, May 17. 10 cts.

Road Construction in British Columbia. 1 1-2 pp., Contract Record, May 3. 20 cts.

Road Methods in Great Britain. Road Board's directions and specifications for surface tarring, tar macadam and pitch grouted macadam. Specifications for tars from gas works and tar distillers, pitch and tar oils. 3 pp., Municipal Journal, May 17. 10 cts.

Work of the Los Angeles County Highway Commission. 3 pp., Engineering Record, May 20. 10 cts.

Road Improvement in Nova Scotia. 1-3 p., Municipal Journal, May 17. 10 cts.

Highway Improvement. Construction and maintenance of earth, sand-clay and oiled earth roads, and culverts. By W. S. Gearhart. Illustrated, 92 pp., Bulletin, Kansas State Agricultural College.

Permanent Way and Highways of Croydon. Paper before Institution of Municipal and County Engineers. By E. F. Morgan. 3 1-2 pp., Surveyor, June 2. 40 cts.

Mountain Road Construction in California. 1 p., Engineering-Contracting, May 21. 10 cts.

Road Building in Delaware. 1-4 p., Municipal Journal, May 17. 10 cts.

Newhall Highway Tunnel, near Los Angeles. Illustrated, 1 1-2 pp., Engineering Record, May 20. 10 cts.

Construction of the Galveston Causeway. Illustrated, 3 pp., Engineering Record, May 27. 10 cts.

Progress of Road Improvements in the South. Paper before Good Roads Congress at Birmingham. By L. W. Page. 1 2-3 pp., Engineering Record, June 3. 10 cts.

Missouri's Diversified Roads. 1-4 p., Municipal Journal, May 17. 10 cts.

Roads of London. 1 1-2 pp., Good Roads, May. 10 cts.

Road Improvements in West Virginia. 1-2 p., Municipal Journal, May 17. 10 cts.

Road Work in Massachusetts. Surface treatment recommended for light traffic; heavy oils heated for surface preservation. Oil and sand building up process. 1 p., Municipal Journal, May 17. 10 cts.

Highways of Croydon. By E. F. Morgan. 2 pp., Contract Journal, April 26. 20 cts.

Experimental Road Work in Allegheny County, Pa. Paper before Engineers' Society of Western Pennsylvania. By S. D. Foster. 1 p., Engineering-Contracting, May 31. 10 cts.

Modern Road Experiments. 1-4 p., Municipal Journal, May 17. 10 cts.

Notes on Object Lesson Macadam Roads Constructed in 1909-10 by the U. S. Office of Public Roads. 1 p., Engineering-Contracting, May 17. 10 cts.

The Bronx Experimental Road. Methods of laying and cost of each of eighteen sections; conditions after six months' use. Bituminous pavements; hand and machine mixing and penetration method. Illustrated, 7 pp., Municipal Journal, May 17. 10 cts.

Demonstration of Constructing Roads. By Curtis Hill. Illustrated, 7 pp., Public Officials' Magazine, May. 10 cts.

Laboratory, Ohio State Road. 1-3 p., Municipal Journal, May 17. 10 cts.

Mechanical Tests to Determine the Relative Value of Various Stone for Road Construction and Maintenance. Paper before Second Irish Road Congress. By H. F. Gullan. 1 p., Engineering-Contracting, May 17. 10 cts.

Road Problem in the Light of Our Present Information. Paper before National Good Roads Congress. By Clifford Richardson. 2 pp., Engineering Record, May 27. 10 cts.

Road Administration, Principles Which Should Govern It. By L. W. Page. Illustrated, 3 pp., Southern Good Roads, June. 10 cts.

State Supervision of Public Roads. By

J. H. Pratt. Illustrated, 3 pp., Southern Good Roads, June. 10 cts.

Tabular Data Concerning State Aid. 2 pp., Municipal Journal, May 17. 10 cts.

Instructions of the Ohio State Highway Department for Inspectors on State Aid Road Work. 1 1-2 pp., Engineering and Contracting, June 7. 10 cts.

Building, The Tractor in Road. Illustrated, 4 1-2 pp., Good Roads, May. 10 cts.

Specifications for Michigan Highways. Construction necessary for receiving state reward; specifications for clay-gravel, gravel, stone-gravel, gravel-stone and stone roads. 1 3-4 pp., Municipal Journal, May 17. 10 cts.

Specifications for Macadam Roads. Bituminous macadam and bituminous concrete paving; asphalt and coal tar cements. Mixing and laying. 3 pp., Municipal Journal, May 17. 10 cts.

Discussion of Road Board's Specifications. 5 pp., Surveyor, May 5; 3 pp., May 12. 40 cts.

Grade Crossing Elimination in Bloomfield and Montclair. Illustrated, 3 pp., Engineering Record, June 10. 10 cts.

Culverts, Some Facts Concerning Concrete. By C. H. Hoyt. Illustrated, 2 pp., Southern Good Roads, May. 10 cts.

Engineering, Art and Science in Highway. By W. W. Crosby. 2 pp., Good Roads, May. 10 cts.

Park Roads. Construction and maintenance of park roads by Metropolitan Park Commission of Massachusetts. 1 p., Municipal Journal, May 17. 10 cts.

Parks and Boulevards of Oklahoma City. By S. T. Bisbee. Illustrated, 2 pp., Municipal Engineering, June. 25 cts.

Sand Clay Object Lesson Road Constructed in 1909-10 by U. S. Office of Public Roads. Some Details of. 2 pp., Engineering-Contracting, May 3. 10 cts.

Gravel as a Road Material. By C. E. Morrison. Illustrated, 3 pp., Good Roads, May. 10 cts.

Traffic, Effect of Motor, on Oil Macadam. By J. S. Van Ornum. 3 pp., Pacific Municipalities, April 29. 20 cts.

Growth of Ordinary Traffic on Irish Rural Roads. Paper before Second Irish Road Congress. By E. K. Dixon. 1 p., Surveyor, May 12. 40 cts.

Development of Mechanical Traction on Roads in Great Britain. Paper before Institution of Mechanical Engineers. By L. A. Legros. 1 p., Engineering News, May 4. 15 cts.

Culs-de-Sac, Roads that are Not Public Roads, and. Paper before Second Irish Road Congress. By W. J. Shannon. 1-2 p., Surveyor, May 5. 40 cts.

Footway Tunnel, Woolwich. Paper before Institution of Municipal and County Engineers. By E. H. Tabor. 1 p., Surveyor, June 2. 40 cts.

Association for Highway Improvement. 1-4 p., Municipal Journal, May 17. 10 cts.

Abstracts of Papers before Irish Road Congress. 3 pp., Contract Journal, April 26; 2 pp., May 3; 3 pp., May 10; 1 p., May 17. 20 cts.

Oil Macadam Specifications Compared. 1 p., Municipal Journal, May 17. 10 cts.

Construction of Oil Macadam Roads in Los Angeles County, Cal. 4 pp., Engineering-Contracting, May 24. 10 cts.

Oil and Tar Distributors. Illustrated, 4 pp., Good Roads, May. 10 cts.

Cost of Oiling Roads. 1-4 p., Municipal Journal, June 7. 10 cts.

Tar Macadam, Kentish Rag. Paper before Institution of Municipal and County Engineers. By T. W. Harrison. 2 pp., Surveyor, May 26. 40 cts.

General Directions and Specifications of the Road Board of Great Britain for the Treatment of Roads with Tar. 2 1-2 pp., Engineering & Contracting, June 7. 10 cts.

Dust Prevention and City Streets. 1-2 p., Municipal Journal, June 7. 10 cts.

Dust and Its Prevention on City Streets. From paper before New England Conference on Street Cleaning. By A. H. Blanchard. 2-3 p., Engineering and Contracting, June 7. 10 cts.

Additional Data on Artificial Dust Layers. Illustrated, 1 1-2 pp., Good Roads, May. 10 cts.

Bituminous Road Compounds, The Scale Paraffine Test as Applied to. By A. W. Dow and F. P. Smith. 3 pp., Engineering News, June 8. 15 cts.

Street Widths, Economic Aspects of. Paper before Third National Conference of City Planning. 3-4 p., City Life, May 25. 5 cts.

Standardized Street Widths. Paper before Third National Conference of City Planning. By John Nolen. 1 1-3 pp., Engineering-Contracting, May 31. 10 cts.

Street Standards and "Elastic" Streets. Street Planning to provide for both present and future; scientific calculation of traffic requirements; initial provision for widening roadway and sidewalk. Papers before National Conference of City Planning. By John Nolen and B. A. Haldeman. Illustrated, 5 1-2 pp., Municipal Journal, June 7. 10 cts.

Standardized Street Widths. Paper before Third National Conference on City Planning. 1 p., Engineering News, May 25. 15 cts.

Width of Wholesale Streets. 1-4 p., Municipal Journal, June 7. 10 cts.

Narrowing Minor Residence Streets. Effect on tenants and property owner; too wide streets require crowded buildings; buildings restriction. From paper before Street Planning Convention. By E. M. Robinson. 2 pp., Municipal Journal, May 24. 10 cts.

Street Surface, The. By G. W. Tillson. 2 1-2 pp., Canadian Municipal Journal, June. 10 cts.

Roads and Pavements in the Borough of Richmond. By T. S. Oxholm. Illustrated, 5 pp., Good Roads, May. 10 cts.

Chicago Street Paving Report. Organization of street department complete and efficient; specifications and contracts criticized; concrete foundations; vehicle tax. From report to Chicago Commission on City Expenditures. By S. Whinnery. 2 pp., Municipal Journal, May 10. 10 cts.

Street Work in Madison, Wis. Tar-bound macadam petitioned for; protecting gutters while applying oil; oiling lessens cost of cleaning catch basins. 1-2 p., Municipal Journal, May 17. 10 cts.

Some Features of Streets and Buildings under the English Public Health Acts. Paper before Institution of Engineers. By J. R. Fayres. 3 pp., Surveyor, May 5. 40 cts.

Pavement Crowns in Washington. Method used for seventeen years; development of formulas for curbs at same and at different elevations. From paper before American Society of Civil Engineers. By T. J. Powell. 3-4 p., Municipal Journal, May 10. 10 cts.

Street Paving Crowns, Washington, D. C. From paper before American Society of Civil Engineers. By T. J. Powell. Illustrated, 1 p., Canadian Engineer, May 4. 15 cts.

Granite Block Specifications of Association for Standardizing Paving Specifications. 2 pp., Canadian Engineer, May 11. 15 cts.

Wood Block Pavement in Chicago. Creosoted. From Report by S. Whinnery to Commission on City Expenditures. 1 p., Engineering Record, May 13. 10 cts.

Brick, Standard Rattier for Testing Paving. 1 p., Engineering-Contracting, May 10. 10 cts.

Causes of Cracking in Cement Grouted Brick Pavements. From Paper before Michigan Engineering Society. By E. R. Whitmore. 1 p., Good Roads, May. 10 cts.

Asphalt Pavement Construction. By S. R. Murray. 1 p., Municipal Journal, May 24. 10 cts.

Asphalt Paving History in New York. Communication from E. P. North. 2-3 p., Engineering Record, May 13. 10 cts.

Plants and Methods of Operation of the Asphalt Paving Companies Operating in New York City. From paper before Brooklyn Engineers' Club. By G. B. Goodsell. 1 p., Engineering-Contracting, May 3. 10 cts.

Asphalt Repairing in Reading. 1-4 p., Municipal Journal, May 31. 10 cts.

Denver Municipal Asphalt Plant. Work done during 1910. Repairs, cement gutters, costs of materials, labor and plant. By

S. R. Murray, Superintendent of Plant. 3-4 p., Municipal Journal, May 10. 10 cts.
Concrete Street Paving in Mason City, Ia. Paper before Iowa Engineering Society. By F. P. Wilson. 2-3 p., Engineering News, June 8. 15 cts.

Concrete Roads in Michigan. 1-4 p., Municipal Journal, May 17. 10 cts.
Suggested Concrete Roadway with Reinforcement of Steel near Top Surface. 1-3 p., Engineering Record, June 7. 10 cts.

Portland Cement Concrete in Highway Construction. Paper before Canadian Cement and Concrete Association. By W. A. McLean. 4 pp., Cement, April. 25 cts. 2 1-2 pp., Concrete, May. 15 cts.

Sidewalk Fallacies. By J. B. Landfield. 1 p., Municipal Journal, May 31. 10 cts.

Notes on Concrete Sidewalk Construction. By J. B. Landfield. 1 1-2 pp., Contract Record, May 31. 20 cts.

Curb and Sidewalk Work, Macadam and Brick Paving at Gary, Ind. 4 pp., Engineering-Contracting, May 10. 10 cts.

Maintenance of Rural Highways. From paper before Second Irish Road Congress. By Arthur Gladwell. 1 p., Engineering-Contracting, May 17. 10 cts.

Road Appliances, Home-Made. Illustrated, 1 1-2 pp., Municipal Journal, May 17. 10 cts.

Control and Cleaning of Streets. Entire control of street pavement, including sidewalks, under one authority; suggested method of assessing cost; broom cleaning and flushing. Paper before Conference of Mayors of New York State. By A. Prescott Fowell. 2 pp., Municipal Journal, June 7. 10 cts.

House Numbering by Latitude and Longitude. 1-4 p., Municipal Journal, May 10. 10 cts.

SEWERAGE AND SANITATION

Sewerage System, Revision of Downtown Chicago's. 2 pp., Engineering-Contracting, May 17. 10 cts.

Main Drainage of Govan, Scotland. Paper before Institution of Municipal and County Engineers. By F. G. Holmes. 1 p., Engineering Record, June 3. 10 cts.

Sewer Work Costs, Comments on Excavation and. From paper before Western Society of Engineers. By Victor Windett. 2 pp., Engineering Record, June 10. 10 cts.

Cost of Pipe Sewers and Appurtenances in Water Bearing Sand, Gary, Ind. Illustrated, 2 pp., Engineering-Contracting, May 10. 10 cts.

Sanitary Engineering Conditions in Milwaukee. 1 1-3 pp., Engineering Record, May 20. 10 cts.

Sewage-Polluted Sea Water with One per Cent Sewage, Chemical Changes Occurring in. By E. A. Letts and E. H. Richards. 7 pp., Journal, Royal Institute of Public Health, May. 60 cts.

Sewage Disposal Works, Proper Methods for Guarding Against Odors in. Address before Congress of Technology. By G. W. Fuller. 3 1-2 pp., Canadian Engineer, May 4. 15 cts. 3 pp., Municipal Engineering, June. 25 cts.

Disposal of Sewage and Protection of the Water Supply of the City of Milwaukee. From Report by J. W. Alvord, G. C. Whipple and H. P. Eddy. 6 pp., Engineering-Contracting, May 24. 10 cts.

New Sewage Disposal Works and Pumping Station, Stratford-upon-Avon. Paper before Municipal and County Engineers. By H. D. Bell. 1 p., Contract Journal, May 17. 20 cts. 1 p., Surveyor, May 26. 40 cts.

Sewage Purification at Reading. 1-2 p., Municipal Journal, May 31. 10 cts.

Treatment of the Govan Sewage. Paper before Institution of Municipal and County Engineers. By W. C. Easton. Illustrated, 3 pp., Surveyor, June 2. 40 cts.

Purification of Sewage. By M. de Montricher. 5 pp., La Technique Sanitaire, May. 50 cts.

Experimental Imhoff Sewage Clarification Tank at Philadelphia and the Original Tanks in the Emscher District of Germany. By Rudolph Hering. 1 1-3 pp., Engineering News, June 1. 15 cts.

Sediment in an Experimental Imhoff Tank. 1 p., Engineering Record, May 13. 10 cts.

Financial Losses and Proposed Preliminary Treatment of Sewage at the Berlin Sewage Farm. 1-2 p., Engineering News, May 4. 15 cts.

Grossman System of Sludge Treatment. 1-4 p., Municipal Journal, June 14. 10 cts.

Health Laws of North Carolina, Act to Amend the. 15 pp., Bulletin, North Carolina Board of Health, March.

Municipal Ordinances, Rules and Regulations Pertaining to Public Hygiene Adopted Since Jan. 1, 1910. Public Health Reports, 4 pp., June 2; 4 pp., May 26; 3 pp., May 12; 4 pp., May 19; 3 pp., June 9.

Function of Research in Municipal Health Administration. From Bulletin, Department of Health, New York. 2 pp., City Life, May 25. 5 cts.

Milk: From Cow to the Consumer. Paper

before Ohio Boards of Health. By G. D. Lummis. 5 pp., Bulletin, Ohio State Board of Health, April.

Diseases, The Fight Against Preventable. Paper before Association of Life Insurance Presidents. By E. H. Porter. 5 pp., Bulletin, Texas State Board of Health, April.

WATER SUPPLY

Water Supply of Marseilles. By M. de Montricher. 4 pp., La Technique Sanitaire, May. 50 cts.

Catskill Water Supply. Progress made to date on the Ashokan reservoir and aqueduct; masonry dam will be completed this year. Expansion joints; tunneling under the Hudson; mud seams and caves; handling seepage. Illustrated, 4 1/2 pp., Municipal Journal and Engineer, June 14. 10 cts.

New Water Supply of Tynemouth, England. By H. G. Coventry. Illustrated, 3 pp., Engineering Record, June 3. 10 cts.

Existing Los Angeles Water Works. By B. A. Heinly. Illustrated. 7 pp., Municipal Engineering, June. 25 cts.

Water Works of Danville, Ill. Illustrated, 4 pp., Municipal Engineering, June. 25 cts.

Greenwood (S. C.) Water and Light Plant. 1/4 p., Municipal Journal and Engineer, May 10. 10 cts.

Water Supply and Fire Protection in the Klondike Gold Fields. 2 pp., Engineering Record, June 3. 10 cts.

Wells, Determining Yield Of. Paper before Illinois Water Supply Association. By A. N. Talbot. Illustrated, 1 1/2 pp., Canadian Engineer, May 11. 15 cts.

Methods and Costs of Deep Well Drilling. From Water Supply Paper No. 257, U. S. Geological Survey. Illustrated, 5 pp., Engineering-Contracting, May 3. 10 cts.

Reservoirs, Construction of Impounding. Paper before Association of Water Engineers. By Edw. Sandeman. Illustrated, 4 1/2 pp., Canadian Engineer, June 8. 15 cts.

Survey of a Reservoir, Made from a Barge. By H. B. Joslin. Illustrated, 2-3 p., Engineering News, June 8. 15 cts.

Constructing of Impounding Reservoirs. Paper before Association of Water Engineers. By Edw. Sandeman. Illustrated, 4 pp., Surveyor, May 19. 40 cts.

The Island Barn Reservoir. Illustrated, 4 pp., Contract Journal, May 3. 20 cts.

Dam Construction, Masonry. Provision for slight settlement and resulting stresses; increase in unit pressure and reduction in section warranted; American engineers commended. Illustrated, 1 1/4 pp., Municipal Journal and Engineer, June 14. 10 cts.

Geology of Dam Trenches. Paper before Association of Water Engineers. By Herbert Lapworth. 2 pp., Surveyor, May 26. 40 cts.

Run-Off, of Minnesota Streams, Variability of During the Low Water Season of 1910. By Robt. Follansbee. Illustrated, 3 pp., Engineering News, May 4. 15 cts.

Interstate Waters, the Law Governing Division of. By C. F. Randolph. 2 1-3 pp., Engineering News, June 1. 15 cts.

Interstate Waters, the Law Governing of. By C. F. Randolph. 2 1-3 pp., Engineering News, June 1. 15 cts.

Law Regarding Control of Waters Crossing State Boundaries. 1 1-3 pp., Engineering News, June 1. 15 cts.

Intake Troubles, Toronto Water Works. Six-foot steel pipe intake stopped with anchor ice; pipe shifted and filled with sand; method of cleaning. Illustrated, 2 pp., Municipal Journal and Engineer, May 10. 10 cts.

Tanks, Concrete, and How to Make Them. From pamphlet issued by Association of American Portland Cement Manufacturers. Illustrated, 2 pp., Canadian Engineer, May 11. 15 cts.

Pipe, Steel and Cast Iron. Paper before American Water Works Association. By Allen Hazen. 1 1/2 pp., Fire and Water, June 7. 10 cts.

Flow of Water in Clean Iron Pipes. By A. E. Guy. Illustrated, 3 pp., Power, June 6. 5 cts.

Instrument for Measuring the Flow of Water in Large Pipe Lines. Paper before Western Society of Engineers. By R. M. Hosea. 2 pp., Engineering-Contracting, May 24. 10 cts. Illustrated, 1 1/2 pp., Engineering Record, May 27. 10 cts.

Aqueduct, Los Angeles. Illustrated, 7 pp., Pacific Municipalities, May. 20 cts.

Tunnel, Rondout Pressure of the Catskill Aqueduct, New York City. By A. D. Flinn. Illustrated, 7 pp., Engineering News, June 1. 15 cts.

Sinking a Wet Shaft. Paper before American Society of Civil Engineers. By J. P. Hogan. Illustrated, 6 pp., Canadian Engineer, May 4. 15 cts.

New Water Supply Tunnel Under New York City. 2-3 p., Engineering News, May 11. 15 cts.

Reinforced Concrete Water Tunnel at Sioux City. Illustrated, 2-3 p., Engineering Record, June 3. 10 cts.

Pumping Plant, Municipal. By T. E. Butterfield. Illustrated, 6 pp., Isolated Plant, June. 10 cts.

Test of a High-Duty Pumping Engine. By R. W. Angus. Illustrated, 1 p., Power, June 13. 5 cts.

Comparative Tests of Large Engines and Turbine-Driven Centrifugal Pumps. By Francis Head. Illustrated, 1 1-3 pp., Engineering News, May 11. 15 cts.

Efficiency and cost of Modern Pumping Engines. Paper before American Society of Civil Engineers. By C. A. Hague. 2 pp., Engineering-Contracting, May 10. 10 cts.

Notes on Designs of Centrifugal Pumps. Paper before Franklin Institute. By M. W. Akimoff. Illustrated, 1 1/2 pp., Canadian Engineer, May 25. 15 cts.

Purity, Standards of. 1 1/2 pp., Municipal Journal and Engineer, June 14. 10 cts.

Pollution Through Water Mains. 1-3 p., Municipal Journal and Engineer, May 10. 10 cts.

Protection of Water Supply. Paper before Society of Engineers. By H. C. H. Shenton. 3 1/2 pp., Surveyor, May 12. 40 cts.

The Red Water Plague. Effort to determine cause of rust in water drawn from faucets; effect of alum treatment; galvanic action; action on iron increased by heat and pressure; remedies suggested. From paper before American Water Works Association. By G. C. Whipple. Illustrated, 6 pp., Municipal Journal and Engineer, June 14. 10 cts.

Esthetic and Commercial Characteristics. 1/4 p., Municipal Journal and Engineer, June 14. 10 cts.

Purification of Drinking Water. By J. L. Leal. Paper before American Water Works Association. 1 p., Fire and Water, June 14. 10 cts.

Modern Methods of Water Purification. By S. Rideal. 1 p., Surveyor, May 26. 40 cts.

Filtration and Purification of Water for Public Supplies. Paper before Institution of Municipal and County Engineers. By Wm. Ransom. 8 pp., Surveyor, May 12. 40 cts.

Multiple Filtration Without the Use of Chemicals. Paper before Association of Water Engineers. By Walter Clemence. 1 p., Surveyor, June 2. 40 cts.

Multiple Filtration. 1/4 p., Municipal Journal and Engineer, June 14. 10 cts.

Construction of Springfield Filters. Paper before Boston Society of Civil Engineers. Illustrated, 6 pp., Canadian Engineer, May 18. 15 cts.

The Rock Island Filter Plant. 2 1/2 pp., Engineering Record, June 3. 10 cts.

Operation of Torresdale Filters and Tests of Schmutzdecke. 1 1/2 pp., Engineering Record, June 3. 10 cts.

Data on the Action of Ejectors for Filter Sand. Paper before New England Water Works Association. By Maurice Knowles. 3 pp., Engineering Record, June 10. 10 cts.

Mechanical Filtration Plant at Cohoes. Illustrated, 2 1-3 pp., Engineering Record, June 3. 10 cts.

Construction of Maiden Creek Slow Sand Water Filters for Reading, Pa. By Mandes Golder. Illustrated, 1 p., Engineering News, May 4. 15 cts.

Louisville Water Works Filters. Illustrated, 1 1/2 pp., Municipal Journal and Engineer, May 31. 10 cts.

Operating Cost and Qualitative Results of Slow Sand and Mechanical Filters, Baltimore County, Md. By S. T. Powell. Illustrated, 2 1/2 pp., Engineering News, May 4. 15 cts.

Sterilization of Water by Ultra-Violet Rays. Paper before Association of Water Engineers. By Max de Recklinghausen. 1 1/2 pp., Surveyor, June 2. 40 cts.

Sterilizing by Ultra-Violet Rays. 1-3 p., Municipal Journal and Engineer, June 14. 10 cts.

Disinfection of Water. Paper before Conference of Ohio Local Boards of Health. By R. G. Perkins. 1 1/2 pp., Engineering Record, May 31. 10 cts.

Apparatus for Applying Chemicals to Water Flowing in Pipes Under Pressure. Illustrated, 1 p., Canadian Engineer, June 8. 15 cts.

Hypochlorite Disinfection of Indoor Swimming Tank at Northwestern University. By W. L. Lewis. 1 p., Engineering News, June 8. 15 cts.

Water Waste Survey in Memphis. Census taken by service districts; consumption registered continuously for a week by pitometer; sources of leakage. Illustrated, 2 pp., Municipal Journal and Engineer, June 14. 10 cts.

Water Meters, The Introduction of, and Water and Health Conservation in New York City. 1 p., Engineering News, June 8. 15 cts.

Water Rate Decision in Illinois. 1 p., Engineering Record, May 13. 10 cts.

Determination of Water Rates for Madison, Wis. 3 pp., Municipal Engineering, June. 25 cts.

Water Rates. Scientific calculation of rates on basis of cost of service; service charge and quantity charge; former regulated by size of service and meter; adequate method of accounting essential. 1 p., Municipal Journal and Engineer, June 14. 10 cts.

Water Works Rate Making. 2-3 p., Municipal Journal and Engineer, June 14. 10 cts.

Fire Hydrant Rates. Rational method of fixing hydrant rates, based upon cost of service; percentage of cost of distribution system chargeable to such service; cost per capita; value of fire protection. From paper before American Water Works Association. By Leonard Metcalf, Emil Kuichling and W. C. Hawley. Illustrated, 6 pp., Municipal Journal and Engineer, June 14. 10 cts. 7 pp., Engineering Record, June 7. 10 cts.

Management Water Works. Paper before Indiana Sanitary and Water Supply Association. By C. H. Hurd. 2 pp., Municipal Engineering, June. 25 cts.

Water Famine in New York City. The Peril of a. What Can Be Done to Avoid It? Illustrated, 3 pp., Engineering News, May 18. 15 cts.

Prepare Now for Water Shortage. ¼ p., Municipal Journal and Engineer, May 10. 10 cts.

New York, Future of Municipal Water Supplies in. Paper before Conference of New York Mayors. By Walter McCulloh. 2 pp., Fire and Water, June 7. 10 cts.

Survey, Illinois Water. ¼ p., Municipal Journal and Engineer, June 14. 10 cts.

Notes, Water Works. ½ p., Municipal Journal and Engineer, June 14. 10 cts. Madison (Wis.) Water Notes. 1-3 p., Municipal Journal and Engineer, May 10. 10 cts.

Questions, Water Works. ¼ p., Municipal Journal and Engineer, May 31. 10 cts.

STREET LIGHTING

Street Lighting Equipment in New York City. By H. T. Owens. Illustrated, 3 pp., Electrical Review, May 27. 10 cts.

Electric Street Lighting. By Albert Scheible. 1½ pp., Electrical Review, May 13. 10 cts. 1½ pp., May 20. 10 cts.

Ornamental Street Lighting a Luxurious Necessity. By C. L. Eshleman. Illustrated, 8 pp., Illuminating Engineer, June. 20 cts.

Illumination, Ratio of Light to. Paper before Illuminating Society of London. By H. P. Harrison. 1½ pp., Electrical Review, June 3. 10 cts.

Fixtures, Development of Street Lighting. By H. T. Owens. Illustrated, 3 pp., Illuminating Engineer, June. 20 cts.

Automatic Street Lighting. 1-3 p., Municipal Journal and Engineer, May 31. 10 cts.

Luminous and Flame Arcs versus Open and Enclosed Carbon Arcs for Street Illumination. Illustrated, 10 pp., General Electric Review, June. 20 cts.

Street Mains and Service Construction Policy. Paper before Southern Gas Association. By K. L. Simons. 1½ pp., Progressive Age, May 15. 20 cts.

Rates, Discrimination in Central Station. By F. F. Fowle. 9 pp., Engineering Magazine, June. 25 cts.

Excessive Rates for Gas and Electric Lighting Through the Operation of a Holding Corporation. 1 p., Engineering News, May 4. 15 cts.

Cheaper Street Lighting in Wichita. ¼ p., Municipal Journal and Engineer, May 10. 10 cts.

Appraisal of Gas Properties in Chicago and Investigation as to Reasonable Rates for Gas. From report by W. J. Hagenah. 12 pp., Engineering-Contracting, May 17. 10 cts.

FIRE AND POLICE

Fire Waste in the United States. Paper before National Fire Protection Association. By W. L. Fisher. 1-2 p., Engineering News, June 1. 15 cts.

Prevention and Control of Fire Through Scientific Methods. Paper before Congress of Technology. By E. V. French. 1 p., Fire and Water, April 26. 10 cts.

Poor Fire Protection at Macon. 1 p., Fire and Water, May 24. 10 cts.

The Fire Prevention Bill of the Merchants' Association. New York. 4 pp., Proceedings, Merchants' Association, May.

Fire Alarm System, Independent. From engineer's report to mayor of Los Angeles. 4 pp., Pacific Municipalities, April 29. 20 cts.

Police Signals and Fire Boxes. 1-4 p., Municipal Journal, May 31. 10 cts.

Fire Boats, Modern Turbine and Electric. Illustrated, 1 1-2 pp., Fire and Water, May 24. 10 cts.

Hydrants, Use of Fire. 1-4 p., Municipal Journal, May 10. 10 cts.

Conflagration, Bangor. 7 pp., Insurance Engineering, May. 25 cts.

Coney Is. and Conflagration. Illustrated, 1 1-2 pp., June 3. 5 cts.

Fireproof Building Destroyed by Fire in Montreal, P. Q. Illustrated, 1 p., Canadian Engineer, May 11. 15 cts.

Identification of Criminals, New Method for the. 1 p., American Review of Reviews, June. 25 cts.

Underwriters' Laboratories. Equipment and scope of work. Illustrated, 6 pp., Insurance Engineering, May. 25 cts.

Commissioner Waldo's Economies. 1 p., Fireman's Herald, May 27. 5 cts.

RAPID TRANSIT

Rapid Transit in the World's Great Cities. By E. M. Bassett. Illustrated, 3 pp., Public Service, June. 20 cts.

Subway Construction by Country Methods. Illustrated, 5 pp., Bulletin, General Contractors' Association, May. 10 cts.

Lengthening the Station Platforms of the New York Subway. By W. G. Federlein. Illustrated, 3 pp., Engineering Record, May 13. 10 cts.

The Pont Mirabeau Crossing of the Seine, Metropolitan Subway, Paris. Illustrated, 2-3 p., Engineering News, May 18. 15 cts.

The 191st Street Subway Station, New York City. Illustrated, 2 1-3 pp., Engineering Record, May 20. 10 cts.

The New North-South Subway in Paris. By W. F. Johnston. Illustrated, 1½ pp., Engineering Record, May 13. 10 cts.

Tunnel, Constructing Land Section of La Salle Street, Chicago. Illustrated, 1 p., Engineering-Contracting, May 3. 10 cts.

Appraisal of the Third Avenue Street Railway System, New York City. 4 pp., Engineering-Contracting, June 7. 10 cts.

BRIDGES AND

STRUCTURAL MATERIALS

Bridges, Concrete. By W. M. Denman. Illustrated, 2 pp., Western New England, May. 15 cts.

Concrete Arch Roadway Bridge. Across the Genesee river at Rochester; reconstructing and extending masonry piers; details of concrete work; imitation granite facing; tower distribution of concrete. Illustrated, 3 pp., Municipal Journal and Engineer, May 31. 10 cts.

Adaptation of Concrete to Long Span Bridges. Paper before Canadian Cement and Concrete Association. 5 pp., Cement, April. 25 cts.

Centering for the 281-ft. Concrete Arch of the Monroe Street Bridge, Spokane, Wash. Illustrated, 2 pp., Engineering News, May 4. 15 cts.

Concrete Bridges and Culverts. By T. H. McDonald. 2 pp., Canadian Engineer, May 4. 15 cts.

Reinforced Concrete Through Arch Bridge in Ohio. Illustrated, 2 pp., Good Roads, May. 10 cts.

Road Bridges in Colorado. ¼ p., Municipal Journal and Engineer, May 17. 10 cts.

New Bridges Over False Creek at Vancouver. Illustrated, 3 pp., Canadian Engineer, May 11. 15 cts.

Design for the Steel Centers for the Rocky River Bridge, Cleveland, O. From paper before American Society of Civil Engineers. By W. J. Watson. Illustrated, 2 pp., Engineering-Contracting, May 10. 10 cts.

Highway Bridge Construction for Municipalities. Illustrated, 4 pp., Western Municipal News, June. 10 cts.

Observations on Recent Steel Bridge Construction in America. From Cornell Civil Engineer. By H. S. Jacoby. 2-3 p., Engineering-Contracting, May 3. 10 cts. 1 1-3 pp., Engineering News, May 18. 15 cts.

Concrete Abutments for Highway Bridges. By H. E. Bilger. Illustrated, 2½ pp., Canadian Engineer, June 8. 15 cts. Illustrated, 2½ pp., Good Roads, May. 10 cts.

Iron, Rusting of. Paper before Brooklyn Engineers' Club. By A. H. Sabin. 1½ pp., Engineering News, May 11. 15 cts.

Concrete Methods. ½ p., Municipal Journal and Engineer, May 31. 10 cts.

Economy of Proper Concrete Plant Arrangement. Illustrated, 2 pp., Cement World, May. 15 cts.

Machine vs. Hand Mixing of Concrete. By Joe Frank. Illustrated, 1½ pp., Pacific Builder and Engineer, April 29. 15 cts.

Handling of Concrete During Cold Weather. By J. H. Chubb. 6 pp., Cement, April. 25 cts.

Retempering Concrete. ½ p., Municipal Journal and Engineer, June 7. 10 cts.

Concrete Methods in Rochester. Retempering concrete an advantage for certain purposes at least; experiments showing strength increased by rettempering and deformation decreased. Use of clay for expansion joints. Illustrated, 2 pp., Municipal Journal and Engineer, June 7. 10 cts.

Further Experiments on the Electrolytic Disintegration of Reinforced Concrete. Illustrated, 1 p., Engineering News, June 8. 15 cts.

Lime, Manufacture and Properties of Hydrated. By R. K. Meade. Illustrated, 4 pp., Engineering News, May 11. 15 cts.

Depreciation of Quick Lime. By W. R. Copeland and W. A. Sperry. Illustrated, 2 pp., Engineering Record, May 13. 10 cts.

Creosote, Analyzing Coal Tar. From American Railway Engineering and Maintenance of Way Association. Illustrated, 1 p., Canadian Engineer, May 4. 15 cts.

Reliability of Materials. Paper before Congress of Technology. By W. C. Fish. 1½ pp., Canadian Engineer, May 25. 15 cts.

MISCELLANEOUS

Garbage and Ashes in New York, Removal of. By Alfred Rossiter. 1½ pp., City Life, May 25. 5 cts.

Street Cleaning Accounting. 1-3 p., Municipal Journal and Engineer, June 7. 10 cts.

Street Dust and Street Cleaning in Relation to Health, Comfort and Economy. Paper before Conference of Ohio Boards of Health. By J. H. Landis. 1½ pp., Canadian Engineer, June 8. 15 cts.

Data on Street-Cleaning Efficiency in Berlin. By Rudolph Hering. 2½ pp., Engineering News, May 18. 15 cts.

City Planning Conference. 1-3 p., Municipal Journal and Engineer, May 24. 10 cts.

City Planning Exhibit and Conference at Philadelphia. Effectiveness of models demonstrated; street dimensions; surface and sub-surface construction. Illustrated, 4 pp., Municipal Journal and Engineer, May 24. 10 cts.

The Third National Conference on City Planning. 2½ pp., Engineering News, May 25. 15 cts.

A Continental Tour. Birmingham's deputation on town development. Illustrated, 2½ pp., Municipal Journal, London, May 27. 15 cts. 1½ pp., May 20. 15 cts.

Town Development on the Continent. The Birmingham deputation's report. Illustrated, 3 pp., Surveyor, May 5. 40 cts.

German Town Planning. 1 p., Municipal Journal, London, May 13. 15 cts.

Relation of Technical Men to City Planning. ¾ p., Canadian Engineer, May 18. 15 cts.

Town Planning and Co-Partnership Housing. By J. S. Nettelford. Illustrated, 4 pp., The Survey, June 3. 25 cts.

Housing Awakening, The. Foreign invasion of a New England town. By E. W. Rogers. Illustrated, 7 pp., Survey, June 3. 25 cts.

House Crowding and House Limitation. By Raymond Unwin. 3 pp., Municipal Journal, London, April 15. 15 cts.

Architecture, High Building in City. ¾ p., Municipal Journal and Engineer, June 7. 10 cts.

Revision of Toronto Building By-Laws. 5 pp., Canadian Engineer, May 25. 15 cts.

Beautifying Municipal Property. Illustrated, ½ p., Municipal Journal and Engineer, May 24. 10 cts.

Bathing Pavilion, Oakland Beach, Rye, N. Y. Illustrated, 4 pp., Architecture and Building, April. 20 cts.

Abattoir, a European. Paper before Society of Engineers. By S. M. Doddington. 2 pp., Municipal Engineering, June. 25 cts.

Park Maintenance, Cost of. ¼ p., Municipal Journal and Engineer, May 31. 10 cts.

Retaining Wall, Study of Economic Design of, for a Special Condition. By J. H. Prior. Illustrated, 2 pp., Engineering-Contracting, May 10. 10 cts.

Municipal Works of Cambridge. Paper before Municipal and County Engineers. By Julian Julian. 1½ pp., Contract Journal, May 10. 20 cts. 3 pp., Surveyor, May 12. 40 cts.

Some of the Public Works of Croydon. Paper before Institution of Municipal and County Engineers. By G. F. Carter. Illustrated, 7 pp., Surveyor, May 5. 40 cts. 2 pp., Contract Journal, April 26. 20 cts.

Municipal Undertakings at Harwich. Paper before Institution of Municipal Engineers. By Thos. Green. 5 pp., Surveyor, May 19. 40 cts.

Woolwich and Some of the Works Completed Since 1905. Paper before Institution of Municipal and County Engineers. By J. R. Dixon. 6 pp., Surveyor, June 2. 40 cts.

Stratford-Upon-Avon Municipal Work. By Roden Dixon. Paper before Municipal and County Engineers. 2 pp., Contract Journal, May 17. 20 cts. 4 pp., Surveyor, May 19. 40 cts.

Public Works Notes of Reading, Pa. 1½ p., Municipal Journal and Engineer, June 14. 10 cts.

Manhattan Island, Proposal to Extend Four Miles Down New York Bay. Communication from T. K. Thompson. Illustrated, 1 p., Engineering News, May 11. 15 cts.

Municipal Engineering at Hamilton, Ont. 3½ pp., Contract Record, May 10. 20 cts.

Need of Professional Co-operation Among Engineers. By A. C. Koenig. 1½ pp., Engineering News, June 8. 15 cts.

Engineering School Graduate: His Strength and His Weakness. Paper before Congress of Technology. By H. P. Talbot. 4 pp., Chemical Engineer, May. 25 cts.

Drafting, Notes on Field. From the Wisconsin Engineer. By H. H. Hunter. 1 p., Canadian Engineer, May 4. 15 cts.

Contracting Practice. By D. V. Moore. Illustrated, 5 pp., Municipal Engineering, June. 25 cts.

Methods of Awarding Contracts. By D. J. Hauer. Illustrated, 3 pp., Contract Record, May 17. 20 cts.

Cost Keeping for Contractors. 1-3 p., Municipal Journal and Engineer, May 24. 10 cts.

Competition in Public Contracts. By C. E. Gillette. 3 pp., Contractor, June 1. 20 cts.

Contractors' Foremen and Their Work. 2 pp., Contractor, June 1. 20 cts.

Purchasing Tools and Plant Charges. By D. J. Hauer. 2 pp., Contractor, May 1. 20 cts.

Notes on the Contract System and the Troubles of a County Surveyor. Paper before Second Irish Road Congress. By E. K. Dixon. Illustrated, 1½ pp., Surveyor, May 5. 40 cts.

A Court Decision as to the Enforcement of the Time Penalty in Engineering Contracts. 1 p., Engineering News, May 18. 15 cts.

Construction Work, Details of. By D. J. Hauer. 2 pp., Contractor, May 15.

Rock, Sounding Bar for Locating. Illustrated, ½ p., Municipal Journal and Engineer, June 7. 10 cts.

Underground Trunk Lines of the American Telephone and Telegraph Company. New. Illustrated, 3 pp., Engineering News, May 25. 15 cts.

Auditor's Duties. By M. L. Hanscom. 5 pp., Pacific Municipalities, May. 20 cts.

Budget Exhibit in Hoboken. Illustrated, ¾ p., Municipal Journal and Engineer, May 10. 10 cts.

Paris Municipal Budget. By L. Dausset. President Municipal Council. 1½ pp., Les Amis de Paris, April. 20 cts.

Efficiency Engineering as Applied to Municipal Problems. By H. G. Field. 2 pp., Pacific Builder and Engineer, May 6. 15 cts.

Efficiency Records. System employed in New York. Division into three classes. Use by Civil Service Commission. By L. F. Fuld. 1¼ pp., Municipal Journal and Engineer, May 31. 10 cts.

Socialism, Cities Trying. 1 1-2 pp., Literary Digest, May 6. 10 cts.

Public Utility Commission, Causes and Effects of a. Paper before Illinois Gas Association. 5 pp., American Gas Light Journal, May 29. 10 cts.

Appraisal of the Seattle Telephone Companies by the Railroad Commission of Washington. By H. S. Gray. 3 1-2 pp., Engineering-Contracting, May 3. 10 cts.

Photographing for the Civic Good. By J. Horace McFarland. Illustrated, 2 pp., Suburban Life, June.

The Art of Roadmaking. By Harwood Frost. New York. Published by the author. 1910. Cloth, 6x9 inches, illustrated, 544 pp. Price, \$3.

The author, an editor by profession who is accustomed to dealing with engineering topics, states that his object in writing the book is to give in a style suitable for the non-technical reader an exposition of the technical and financial problems involved in road making and paving. It should not be assumed, however, that the book is of no value to the engineer. The contrary is the case, for the descriptive portions dealing with more recent styles of construction are not so well presented in any text books, although the reader who keeps posted on current technical magazine literature may

not find much that is novel to him. The topics dealt with in the opening chapters are the conventional introducing ones, resistance to traction, road and pavement economics, and the principles underlying the selection of pavements for different purposes. These chapters constitute Part 1 of the book. The second part deals with country and suburban roads, and the third with city streets and pavements. The second part is that which will perhaps be the most read, because it deals with a topic of great general interest. The location of roads with a view to securing suitable grades and other factors is given a chapter. Construction and protective works, in which the importance of drainage is clearly brought out, are given a chapter, together with a brief discussion of highway bridges and retaining walls. The agencies, chemical, physical and mechanical, which cause the destruction of roads, are explained in connection with an enumeration of road building materials and their relative values. Earth, gravel, sand and clay roads, are described at considerable length, and broken stone roads are given a separate chapter. The chapters on road maintenance and dust prevention contain many practical instructions. Under the caption "State Aid Laws" there are included extracts from a number of State specifications. Chapter contains information not easily accessible, at least in one volume. In the third part of the book specifications, methods of construction and costs of stone block, brick, wood block, asphalt and concrete are discussed, and the merits and defects of each kind of pavement are pointed out fairly and impartially. Modern methods of street cleaning, including flushing, are described, and even the treatment of the roadside, the selection of trees, is not forgotten. In general, it may be said that the author has accomplished his stated purpose, and the book should prove valuable to officials in charge of roads and citizens generally interested in the subject of roads and pavements who may not have had the advantage of a technical education. When it is borne in mind that the responsibility for the selection of road and street pavements rests generally on those who are assessed for it, the number to whom the book appeals is not few. The illustrations are well selected, with a view to bringing out practical points treated of in the text.

Practical Talks on Contracting. Being reprints from the Contractor of valuable papers by Frank B. Gilbreth. C. A. Worden and E. S. Hanson. Chicago: Contractors' Publishing Company, 1910. Cloth, 5½ by 9, 128 pp. Price, \$1.50.

The leading paper in this series concerns the systematizing of a contractor's office. From this it need not necessarily be inferred that the book is of no value to the large number of contractors who have their offices under their hats. In the short space of 128 pages it is scarcely possible to establish rules by which all contractors may make a lot of money. However, as one good idea might be worth the price of the book and the hour or so necessary to read it, we can conscientiously recommend the book to both large and small contractors. As having a bearing on the general subject of contractors' accounting, an incident may not be amiss. A superintendent for a large contracting company, which had one of the best systems of reporting and accounting, went into business for himself. His foremen make no daily reports and his bookkeeper and cashier spends most of his time acting as a plant foreman. It seems to the reviewer that this contractor is making a mistake, although the contractor is a man of wide

experience and marked ability. The advent of the automobile, however, has something to do with the question. A superintendent or contractor can now give personal attention to work to an extent hitherto unknown, therefore he need not depend so much on reports.

The captions of the papers give a good idea of the scope of the work. They follow: Systematizing a Contractor's Office. Organization—How to Effect and Maintain It. Between Profit and Loss. Office System for Construction Work. Liability Insurance for Contractors. Important Things to Consider in Estimating. Purchasing Records for Contractors. Tools and Equipment Records. Contractor's Daily Reporting System. Earthwork Records. The Operation of Camps and Commissaries. How Contractors Use Photography.

Bricklaying System. By Frank Gilbreth. New York and Chicago. The Myron C. Clark Publishing Co. Cloth, 6 by 9 inches, illustrated, 321 pp. Price, \$3.

As the author states in his introduction the art of bricklaying is thousands of years old, and during this time the bricklayer has not had to compete with machinery. The knowledge of the art has been handed down from journeyman to apprentice for generations. The purpose of the author is to put this knowledge in print that it may assist the apprentice and enable him to become a proficient workman in the shortest possible time. Besides this the author has introduced some ideas of his own, the result of long study of the motions ordinarily made by a bricklayer. His claim is that by making these motions as simple as possible a greater speed in laying brick may be attained without any greater exertion required by the old ways. The meeting on the same piece of work in the United States of men who learned the trade in different countries has done much to show the best methods and eliminate the slow ones. In the course of the volume, every detail of bricklaying seems to be gone into minutely, with matters of economy always in view. The chapters on motion study and their application to the subject in hand will doubtless be of most interest to the reader who is not a bricklayer.

Shade Trees in Towns and Cities. By William Solotaroff. Octavo, cloth; 280 pages; illustrated. John Wiley & Sons, New York. Price, \$3 net.

The author of this work is Secretary and Superintendent of the Shade Tree Commission of East Orange, N. J., and has written many articles on the general subject of shade trees, several of which have appeared in "Municipal Journal," and is a recognized expert on the subject. The scope of this book is indicated by the sub-title, "Their selection, planting and care as applied to the art of street decoration; their diseases and remedies; their municipal control and supervision." Not the least valuable part of the work are the illustrations, practically all of which are from photographs taken by the author to illustrate the various trees, both their general appearance and their leaves and fruit; injuries and diseases; injurious insects; methods of pruning, surgery, etc. The information given is that needed by shade tree superintendents and thoroughly covers the ground. Much of it is not readily accessible elsewhere, or only in scattered volumes. It should also be of value to the private owner who has shade trees on street or lawn. The final chapters are arguments for city control of shade trees and a summary of the legislation of the several States on the subject. The book can be commended as thoroughly reliable.

INDUSTRIAL NEWS

Cast Iron Pipe.—Chicago: Prices continue firm. Quotations: 4-inch, \$25.50; 6 to 12-inch, \$24.50; 16-inch and up, \$24. Birmingham: Shipments continue fairly satisfactory. It is reported that a foundry that has been idle thus far this year will likely change hands at an early date, with a view of its being put in operation. Quotations: 4 to 6-inch, \$22.50; 8 to 12-inch, \$22; over 12-inch, \$21. New York: Considerable inquiry has sprung up from the general trade. Quotations: 6-inch, carloads, \$21 to \$22.

Lead.—Market is stronger. Quotations: New York, 4.45c; St. Louis, 4.30c.

Crushing Ashes and Rubbish.—Knowles & Co., Boston, Mass., the contractors for reclaiming objects of value from the rubbish collected by the Public Works Department of Boston, have installed a No. 3 Gardiner crusher at their plant at the west end of Massachusetts avenue. Objects of value, as heretofore, are picked out and the remaining rubbish, including paper, tin cans, bottles, etc., are crushed up together with ashes and the product used for filling land.

Auto Engine Test.—Chairman J. Ross Bowdre, Macon, Ga., is greatly disappointed over the showing made to date by the new LaFrance auto chemical engine. This was purchased at the same time as the two new Webb machines and arrived several weeks ago. It has failed to give satisfactory service and seems to be in such poor shape that the company has been requested to send an expert to repair it. The two Webb auto engines are doing fine work whenever called upon. The Webb chemical is expected next week. If the LaFrance chemical ever performs satisfactory work and just as soon as the new Webb chemical arrives the South Macon and Vineville fire houses will be equipped.

Annual Report.—The annual report of the Westinghouse Electric & Manufacturing Co. for the year ending March 31, 1911, shows gross earnings of \$38,119,312 and manufacturing and selling expenses of \$32,510,547, leaving a net manufacturing profit of \$5,608,765. An income of \$1,515,532 was also received from interest, discounts, dividends, royalties and other sources, making a total income of \$7,124,297. The expenditures for interest, depreciation and other charges were \$2,243,191, leaving a surplus of \$4,881,106 for the year, which was the largest in the company's history as respects both gross earnings and net income. The directors believe, however, that the volume of business now offering is on a diminishing scale and that the results of the last year are no certain indication of a continuance for the future of gross earnings and net profits such as the past 12 months have produced. Another condition affecting profits is the expiration of the patent agreement between the Westinghouse and General Electric companies, which expired April 30, 1911, and will probably not be renewed; the patent agreements with other companies have been canceled because they might be considered in violation of the anti-trust laws. For these and other reason the directors decided to pass dividends on the assenting stock.

Asphalt Macadam Roadways.—The American Asphaltum and Rubber Co. have published in pamphlet form a paper called Asphalt Macadam Roadways and the Success of the Penetration Method of Applying Binder, read at the annual meeting of the Michigan Engineering Society at Lansing, January 12, 1911. The paper gives a description of a suitable binder, defining the specific gravity, melting point and other properties. Taking up the question of thickness of bituminous material the fallacy of the argument that four inches of bituminous material is twice as good as two inches is exposed. The increase in cost is not accompanied by a corresponding increase in durability and a thickness of two inches is considered as sufficient. The question of quality and grading of stone is taken up and a size varying from 1¼ inch to 2½ inch in the largest dimension advocated. The necessity of proper rolling before the binder is put on is explained. The methods of applying binder are discussed and the use of an ordinary 500 gallon heater and ordinary pouring cans advocated for small work at least. Good advice to the contractor is given regarding such details as heating the binder, putting on top dressing, applying paint coat and brooming. A complete copy of specifications for asphalt macadam roadways, penetration or pouring method is added.

Concrete Bridge Patents.—The National Bridge Company, of Indianapolis, Ind., now owns 17 Luten patents on cost-saving devices in concrete bridges. Forty-seven other applications for Luten patents are still pending. Several of the above patents have been declared valid in the United States Circuit Courts with injunctions issued against infringers and numerous other suits for infringement are being filed. The National Bridge Company now announces that in the future as in the past all Luten patents will be available to any contractor as a license on prepayment of a fixed royalty; that infringers who have infringed in the past will not in general be prosecuted for such past infringement; but when an effort has been made by licensees of this company to secure consideration of plan designed by Daniel B. Luten, consulting engineer, and the award has been made to other contractors, on plans embodying features of the Luten patents, that then a suit for an injunction will be filed against the infringing contractor.

New Police Alarm System.—The new signal phone police alarm system at Mishawaka, Ind., installed by the Signal Phone Company of Milwaukee, is now complete and in operation. The numbers of boxes are as follows: 4, Main and Second streets; 5, Second and Smith; 6, West and Seventh; 7, Eighth and Main; 21, Joseph and Main; 22, Margaret and Lawrence; 24, Battell; 25, Joseph and Cedar streets; 26, Union and Fourth; 32, Merrifield avenue and Second street. Flashlight and bells will be used at Sixth and Main, Wells and Second, Cedar and Second, Sixth and Main, Joseph and Battell and Battell and Main. E. E. Salisbury, for the company, gave the final touches to the system for a final test. The system is now in use under the direction of Chief of Police Harvey Frick.

Consulting Engineers.—Messrs. Rudolph Hering and George W. Fuller, hydraulic engineers and sanitary experts of New York City, announce the termination of their ten-year partnership agreement under the firm name of Hering & Fuller, excepting as to certain existing engagements which they as a firm will complete. For all new engagements they will hereafter conduct independent offices at their present address, 170 Broadway, New York.

Messrs. Rudolph Hering and John H. Gregory announce that they have entered into partnership as consulting engineers and sanitary experts, with offices at 170 Broadway, New York City, and will conduct an engineering business covering investigations, reports, designs and superintendence relating to projects concerning water supplies, water purification, sewerage, sewage purification and refuse disposal.

Auto Fire Engine.—For the second time the Knox gasoline propelled and gasoline pumping fire engine and hose wagon, with which the New York Fire Department has been experimenting, failed last week, this time ceasing to operate at Twenty-second street and Coney Island boulevard, Brooklyn, while undergoing a test for speed. It had started out from the repair shops at Fifty-sixth street and Eleventh avenue, Manhattan. Battalion Chief Howe, Capt. Demorest of the Bureau of Repairs and Supplies, and Capt. Henry, the supervising engineer of the Fire Department, were following the engine in another machine. Under the contract terms the engine was to pump 700 gallons of water for three hours. Two weeks before a test of her pumping capacity was given at the repair shops in Manhattan. After pumping for seven minutes the machine caught fire and the test was abandoned.

Imhoff Patents.—The Pacific Flush Tank Company, Singer Building, New York, N. Y., and The Temple, Chicago, Ill., announce that they have become the American representatives for the patents covering the Imhoff tanks for sewage treatment.

Corporation Election.—Westinghouse, Church, Kerr & Co., New York, announce that John F. Wallace has been elected president of the company.

Mueller Sewer Rod.—H. Mueller Mfg. Co., Decatur, Ill., have placed on the market a steel sewer rod for use in opening clogged sewers. The rod is flexible enough so that it can be carried about in a coil, yet stiff enough to do the required work. It is a continuous strip of special spring steel; its flexibility will allow it to follow irregularities in the line of the sewer. However, it has enough strength and spring to keep it from buckling or breaking. When it is withdrawn it becomes a straight steel rod that can be readily coiled as it is taken from the sewer.

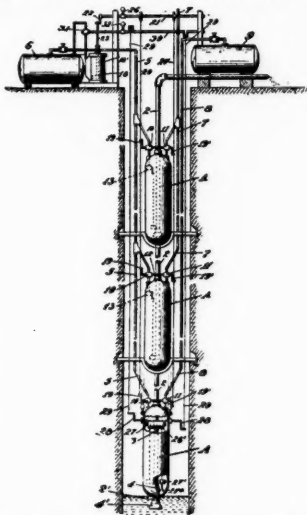
The working end is provided with a sharp spear point which will easily penetrate any obstruction in the passage. Just back of the point there are a number of tacks bent outward but projecting backward from the spear point so that they will not interfere with the penetration of the rod. By working the rod back and forth obstinate stoppages may be torn loose.

The Mueller sewer rod is furnished in lengths of 25, 40, 50, 60, 75 and 100 feet. Rods of all these lengths for use in 8-inch and smaller sewers are made of ½ x 1¼-inch steel. Rods 75 and 100 feet long for use in sewers larger than 8 inches are made of ½ x 1½-inch steel.

PATENT CLAIMS

995,248. DEEP-WELL PUMP. Peter J. Gildea, San Francisco, Cal. Serial No. 564,469.

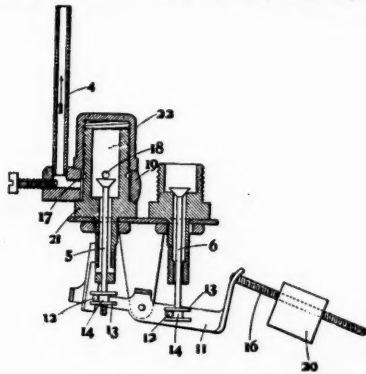
An apparatus to raise liquids, said apparatus comprising a series of superposed spaced cylinders or receivers, with connecting pipes and check and foot valves, means to fill the lowermost cylinder, connections through which air under pressure is intro-



duced above the surface of the liquid to force the liquid successively from each cylinder to the one above, a valve-controlled air supply to said pressure connections, and means controlled by the level of the liquid in a cylinder for opening the air supply valve to admit air to said pressure connections.

994,140. GAS LIGHTING AND EXTINGUISHING APPARATUS. Edmund H. Elton and Richard Stephens, Cleveland, England. Serial No. 476,411.

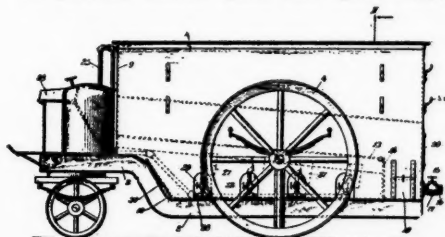
Apparatus for lighting and extinguishing gas burners from a distance comprising main and pilot burner valves, a lever in connection with said valves, an adjust-



able weight on said lever, a diaphragm, and means permitting of retaining the main burner valve open on a slight decrease of gas pressure comprising a pivotally mounted lever on said lever means limiting the rocking movement of said second lever and means connecting the second lever to the diaphragm.

994,579. SNOW-MELTER. Christian Eberstaller, Roselle, N. J. Serial No. 557,748.

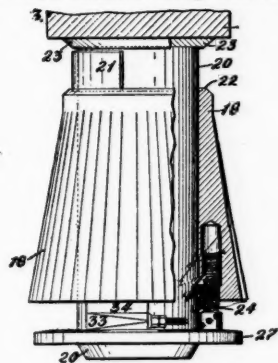
A snow melting apparatus comprising an outer main body or receptacle, an inner snow receiving receptacle of sufficiently less cross sectional area and less depth to provide lateral space and space below



the bottom of said snow receiving receptacle, said inner receptacle having a depending extension forming a well below the plane of the bottom of said inner receptacle, at its rear end, and means for heating the bottom of said inner receptacle.

995,044. HEAD-ADJUSTING DEVICE FOR GYRATORY STONE-CRUSHERS. Edgar B. Symons, Milwaukee, Wis., assignor to Smith & Post Co., Milwaukee, Wis., a Corporation of Wisconsin. Serial No. 535,227.

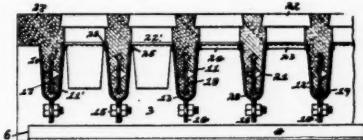
In a rock crusher, a crusher shaft, shoulders projecting from said shaft, a crusher head slidable along said shaft, re-



movable distance collars in halves spacing said head from one shoulder and a screw tapped into the head and reacting against the other shoulder for holding said head and collars up to said shoulder.

994,540. MOLD FOR FORMING SIDEWALKS AND OTHER LIKE CONSTRUCTIONS. Henry C. Seipp, Coraopolis, Pa. Serial No. 550,213.

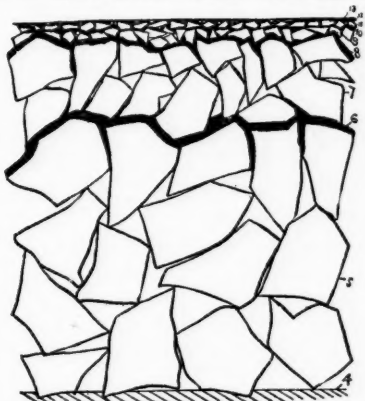
In a mold for forming sidewalks and other like constructions, the combination with re-



movable supporting means, of a vertical slotted mold supporting plate on said means, and a removable mold section of trough-shaped form on said plate.

995,147. COMPOSITE PAVEMENT. Harry G. Jennison, Toledo, Ohio. Serial No. 538,348.

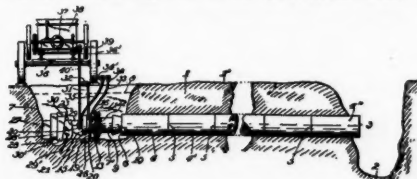
The combination in a pavement of a base, a hydrocarbon binder thereon, a wearing layer wholly of road metal anchored by said binder, said layer having unfilled voids, and a hydrocarbon binder covering said



road metal layer and spaced from said anchor binder, the quality of binder being gaged to preserve cushioning effect of the unfilled voids in road metal layer upon laying to thereby confine hydrocarbon binders to serve only as binders.

995,404. MEANS FOR CLEARING OBSTRUCTED DRAIN-PIPES. Artemus N. Hadley, Indianapolis, Ind. Serial No. 435,548. Divided. Serial 515,186.

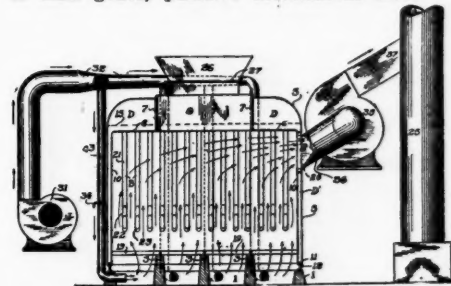
Apparatus for clearing a drainage pipe line embedded in the ground, including a water-delivering machine provided with a



delivery end adapted to be placed unattachably to the end of a section of the pipe line, and means independent of the pipe line for holding the delivery end forcibly in contact with the end of the section.

994,636. GARBAGE-INCINERATING AND STEAM-GENERATING SYSTEM. Charles A. Byrne, Minneapolis, Minn., assignor of one-half to Frank Dunning, Osseo, Minn. Serial No. 535,034.

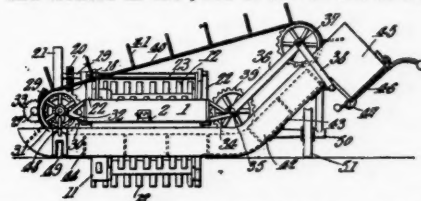
An apparatus for incinerating garbage comprising in combination, a single combustion chamber having an outlet, a fire grate therein, means supplying forced draft to said grate, positive mechanical means



communicating with said outlet for maintaining an induced draft, and means in said chamber for suspending the garbage over and closely adjacent the grate at a point between the grate and the outlet whereby products of combustion from the grate penetrate and pass through the garbage.

994,746. DITCHER AND GRADER. Robert E. Raynes, Spencer, N. C. Serial No. 565,793.

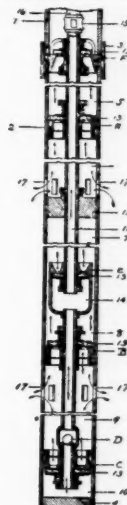
In a ditching machine, a journaled rotor having at its periphery radially disposed bits, a shaft journaled at the side of the rotor and operative from the same, a cam carried by said shaft, a pivoted arm at one end located in the path of movement of the



cam, a scraper carried by said arm and at times located in the path of movement of the bits, the parts being so arranged that the cam engages the arm and swings the same so that the scraper is carried beyond the path of movement of the bits as the bits approach the same.

994,310. DEEP-WELL PUMP. James Gleason, Green Bay, Wis. Serial No. 577,122.

In a deep-well pump a suspension pipe, a pump cylinder attached thereto, said cylinder closed at the lower end, a diaphragm in said cylinder dividing the working space into two approximately equal parts, a diaphragm valve between the cylinder and the suspension pipe, two rows of ports in the sides of said cylinder opening into the two working spaces, a sucker rod, a hollow pump rod open at its lower end, and



connected to the pump rod with a coupling having open port holes, a downwardly opening bucket at the lower end of the pump rod, a ball valve in said pump rod above the lower bucket, an upwardly opening bucket attached to the pump rod in the lower working section of the cylinder, a cage valve on said pump rod above the upwardly opening bucket, an upwardly opening bucket attached to said pump rod above said diaphragm in the upper working space of said cylinder, as set forth.

THE WEEK'S CONTRACT NEWS

Relating to Municipal and Public Work—Street Improvements—Paving, Road Making, Cleaning and Sprinkling—Sewerage, Water Supply and Public Lighting—Fire Equipment and Supplies—Bridges and Concrete Work—Sanitation, Garbage and Waste Disposal—Police, Parks and Miscellaneous—Proposals and Awards.

To be of value this matter must be printed in the number immediately following its receipt, which makes it impossible for us to verify it all. Our sources of information are believed to be reliable, but we cannot guarantee the correctness of all items. Parties in charge of proposed work are requested to send us information concerning it as early as possible; also corrections of any errors discovered.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Ohio.....	Cincinnati.....	June 23, noon.....	Repairing portion of Blue Rock pike; also for oiling Colerain pike in Colerain twp. and Cleves and Bridgetown pike in Green and Miami townships.....	Stanley Struble, Pres. Bd. Co. Comrs.
Dist. of Col....	Washington.....	June 23, 2 p.m.....	Laying gutters and bituminous macadam pavement and setting curb on various streets.....	C. H. Rudolph, Chm. Commissioners.
Pennsylvania...	Pittsburg.....	June 23, noon.....	Furn. 5,000 bbls. of Portland cement during nine months ending March 31, 1912.....	J. R. Cunningham, County Compt.
Ohio.....	Rocky River.....	June 23, noon.....	Constructing cement walks on North Ridge Road.....	W. M. Dean, Town Clerk.
Ohio.....	Youngstown.....	June 23, noon.....	Repairing sheet asphalt streets; and paving portion of Myrtle av.	W. H. McMillin, Clk. Dept. Pub. Ser.
Ontario, Can...	Kingston.....	June 24, noon.....	Constr. 15,000 sq. yds. of asphaltic macadam; and 9,700 lin. ft. curb and gutter.....	H. B. R. Craig, City Engineer.
Ohio.....	Bowling Green...	June 24, 2 p.m.....	Grading, draining, macadamizing and oiling Wallace avenue..	W. A. Mariner, Service Director.
Massachusetts...	Holyoke.....	June 26.....	Constr. about 5,200 sq. yds. granite block or brick pavement..	Board Public Works.
Iowa.....	Maquoketa.....	June 26, noon.....	Paving with brick blocks, creosoted block & asphaltic concrete various streets.....	E. J. Kullmer, City Clerk.
New Jersey....	Plainfield.....	June 26, 8 p.m.....	Paving about 40,000 sq. yds. with plain and bituminous.....	Jas. T. MacMurray, City Clerk.
Nebraska.....	Lincoln.....	June 27.....	Paving portions of roads Nos. 667 and 1225, 9,564 sq. yds. Class "C" and "G"; 10,760 lin. ft. artificial stone curb.....	H. E. Wells, County Clerk.
Ohio.....	Lorain.....	June 27, noon.....	Improving various streets and alleys by paving with macadam, sheet asphalt, block asphalt or vit. brick, with necessary excavation, draining, curbing, foundations, etc.....	L. B. Johnson, Clk. Dept. Pub. Serv.
New York.....	Buffalo.....	June 27, 11 a.m.....	Paving and repaving various streets.....	Francis G. Ward, Comr.
Maryland.....	Havre de Grace...	June 27, 8 p.m.....	Improving certain streets, consisting of about 5,160 cu. yds. excavation; 8,480 sq. yds. bituminous macadam; 120 cu. yds. masonry.....	Murray Vandiver, Chm. Imp. St. C.
Virginia.....	Norfolk.....	June 28.....	Constructing new highways in Wise county.....	State Highway Com.
Tennessee.....	Wise Ct. House..	June 28, 11 a.m.....	Constructing about 81 miles of county highway.....	Bd. Superv. Wise County.
Ohio.....	Columbus.....	June 28.....	Furnishing and applying 10,489 gals. surface treatment on Harrisburg Pike; 15,739 gals. on Sunbury Pike and 13,630 gals. on National Road.....	John Scott, Clk. Bd. Co. Comrs.
Ohio.....	Lowellville.....	June 28, 2 p.m.....	Improving three roads in Mahoning township.....	W. J. Maurice, Township Clerk.
California.....	Sacramento.....	June 28, noon.....	Constr. 14 miles of Trinity State Highway.....	N. Ellery, State Engineer.
Pennsylvania...	Greensburg.....	June 29, 11 a.m.....	Construction and permanent improvement of four county roads about 68,348 feet.....	J. D. Miller, Chm. Co. Comrs.
Ohio.....	Cincinnati.....	June 30, noon.....	Treating with tar Hillside ave. and Warsaw pike; oiling Springfield pike in Springfield township.....	Stanley Struble, Pres. Bd. Co. Comrs.
Arkansas.....	Little Rock.....	June 30.....	Paving about 13,000 sq. yds. with creosoted block; 25,000 sq. yds. of macadam.....	E. A. Kingsley, Engineer.
Arkansas.....	Argenta.....	June 30.....	Constr. about 30,000 sq. yds. creosated block pavement; 25,000 sq. yds. macadam.....	Mayor Faucette
Kentucky.....	Middlesboro.....	July 1.....	Constr. sidewalks, curb and guttering in various streets.....	E. S. Helburn, Mayor.
Georgia.....	Rome.....	July 1, noon.....	Grading, curbing and paving various streets with wood block vit. brick, Hassam, asphalt macadam, sheet asphalt and bitu.	J. R. Cantrell, City Clerk.
Indiana.....	Greencastle.....	July 1.....	Constr. about 40,000 ft. of macadam road in Putnam County..	D. V. Moffett, County Auditor.
New Jersey....	Westfield.....	July 3, 8:15 p.m.....	Constr. about 3,200 sq. yds. bituminous macadam pavement, concrete culverts, drains and appurtenances; 1,000 cu. yds. ex.	Chas. Clark, Town Clerk.
West Virginia..	Parkersburg.....	July 3.....	Paving with brick portions of 4 roads in Wood County.....	C. S. Skidmore, County Engineer.
New York.....	Olean.....	July 5, 8 p.m.....	Constr. about 9,800 sq. yds. of wire-cut-lug block pavement; 6,000 lin. ft. stone curbing.....	John H. Gaynor, Engineer.
Florida.....	Tampa.....	July 5, 2 p.m.....	Resurfacing about 1½ mile road in Hillsboro County with shell or its equivalent.....	Bd. County Comrs.
Indiana.....	Vincennes.....	July 5, 2 p.m.....	Constr. about 93,400 ft. of gravel roads in Knox County.....	John T. Scott, County Auditor.
West Virginia..	Huntington.....	July 6, 1 p.m.....	Paving various streets with vit. brick, asphalt, bitulithic, tarvia or asphalt block.....	A. B. Maupin, City Engr.
Oregon.....	Grants Pass.....	July 6.....	Constructing 30,000 sq. yds. of pavement.....	F. E. Hobson, City Engineer.
Mississippi.....	Meridian.....	July 6, 2 p.m.....	Constr. 12.35 mi. Novaculite roadway; 2 mi. sand-clay road.....	W. P. Moore, Chief Engineer.
New York.....	Olean.....	July 6, 8 p.m.....	Constr. about 5,000 sq. yds. wire-cut-lug block pavement on concrete foundation; 3,500 lin. ft. stone curb.....	John H. Gaynor, Engineer.
Illinois.....	Denison.....	July 6, 2 p.m.....	Constructing various macadam roads.....	Geo. Gray, Comr. Highways.
Ohio.....	Cincinnati.....	July 7, noon.....	Oiling Harrison pike in Harrison and Whitewater townships; also repairing Indian Hill avenue in Columbia township.....	Stanley Struble, Pres. Bd. Co. Comrs.
North Carolina..	High Point.....	July 10, 1:30 p.m.....	Grading, curbing and macadamizing various streets, estimated cost \$40,000.....	Fred N. Tate, Mayor.
Iowa.....	Greenfield.....	July 11, 2:30 p.m.....	Constr. about 14,000 sq. yds. brick or cement paving; 4,500 lin. ft. curb; Iowa Engeer. Company, Chase Block, Clinton, Iowa, Engineers.....	Town Clerk.
Ohio.....	Greenville.....	July 15.....	Constructing the Althoff road in Patterson township.....	Bd. County Comrs.
Tennessee.....	Johnson City....	July 20, 6 p.m.....	Constr. 23,000 sq. yds. paving, including bridges, sewers, storm water drain, concrete curb and gutter, consisting of about 5,000 cu. yds. excavation; 23,000 sq. yds. paving; 12,000 lin. ft. curb and gutter.....	W. M. Dunlap, City Comr.
SEWERAGE				
Connecticut....	South Norwalk...	June 25.....	Laying 925 lin. ft. of 18-in. and 750 lin. ft. of 12-in. vit. pipe sewer with appurtenances.....	Samuel W. Hoyt, Jr., City Engineer.
South Dakota...	Aberdeen.....	June 26.....	Constr. about 1,860 ft. of 18 and 8-in. pipe sew. and 5 manholes	F. W. Raymond, City Auditor.
Iowa.....	Nevada.....	June 26, 7:30 p.m.....	Constr. sewage disposal plant consist. of septic tank; 2 filters & about 3,060 ft. of 15-in. vit. sewer and 730 ft. of 15-in. concrete sewers on piers with manholes; also constr. 1,480 ft. of 12-in., 5,920 ft. of 10-in. & 27,090 ft. of 8-in. vit. pipe sewers	City Clerk.
Rhode Island...	Woonsocket.....	June 27, 4 p.m.....	Constr. about 900 ft. of 8-in. sanitary sewer and appurtenances and about 500 ft. surface water drain.....	Frank H. Mills, City Engineer.
North Carolina..	Red Springs.....	June 27, 3 p.m.....	Constr. a sewer system including 4½ miles of 8 to 15-inch pipe..	A. B. Pearsall, Chm. Bd. Pub. Wks.
Minnesota.....	Morris.....	June 27, 8 p.m.....	Constr. 3,232 ft. of 8-in. sewer, 4-in. tile drain, manholes, flush tank, etc.....	C. B. Burpee, City Clerk.
New York.....	Hempstead.....	June 27, noon.....	Bldg. about 122,930 lin. ft. 8 to 20 in. vit. pipe, about 2,000 lin. ft. 8 to 18-in. cast iron pipe, about 115,300 cu. yds. excavation, 3,000 vert. ft. concrete manholes, 113 flush tanks, 445 man-hole covers, 18,000 lin. ft. 6-in. vit. pipe for house service, two pumping plants and one disposal plant.....	M. O. Hedges, Clk. Vil. Bd.
Maryland.....	Baltimore.....	June 28.....	Constr. storm water sewers in the bed of Jones' Falls, preliminary to constructing boulevard over Falls.....	J. H. Preston, Mayor.
New York.....	Binghamton.....	June 28, 4 p.m.....	Laying vit. pipe sewer with necessary manholes, catch basins, flushing tanks, and connections, in Union, Brace and Berlin sts	S. W. Murray, Clk. Bd. C. & Sup.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
SEWERAGE (Continued)				
New York.....	Hudson.....	June 29, 6 p.m.....	Constr. 10-in. vit. tile sewer on Green street.....	M. J. O'Hara, City Engineer.
Wisconsin.....	Independence.....	June 29, 8 p.m.....	Constr. sewers consisting of 10 lin. ft. of 30-in. steel pipe; 1,089 lin. ft. 24-in. vit. pipe; 1,254 lin. ft. 20-in. vit. pipe; 1,254 lin. ft. 15-in.; 1,200 lin. ft. 12-in., with house connections, and appurtenances.....	Jacob Jackson, Village Clerk.
Ohio.....	Bucyrus.....	June 30.....	Constr. 7,700 lin. ft. of 10 to 20-in. vit. tile sanitary sewer; 6,700 lin. ft. of 4 and 5-ft. concrete and brick sewer.....	F. L. Niederheiser, City Engr. E. L. Williams, City Clerk.
Wisconsin.....	Appleton.....	June 30.....	Constructing sewer in portion of Lawrence Street.....	
Utah.....	Salt Lake City.....	June 30.....	Extending gravity outlet sewer from present outlet to Great Salt Lake.....	H. G. McMillan, Chm. Bd. Pub. Wks.
Kansas.....	Parsons.....	July 1.....	Constr. sewers of double strength vit. pipe with septic tank of concrete and pumping station. Est. cost \$65,000 to \$70,000.....	City Clerk.
California.....	San Jose.....	July 3.....	Construct septic tank for County hospital.....	City Clerk.
South Dakota.....	Madison.....	July 6, 8 p.m.....	Bldg. sewer system about 31,465 lin. ft. 6 to 18 in. vit. pipe.....	George H. Waskey, Mayor.
North Carolina.....	High Point.....	July 10, 1:30 p.m.....	Constr. sewer and water lines amounting to about \$50,000.....	Fred N. Tate, Mayor.
Ohio.....	West Lafayette.....	July 10.....	Constructing storm water sewers. Est. cost \$16,000.....	E. L. Thompson, Village Clerk.
WATER SUPPLY				
Arkansas.....	Mena.....	June 23.....	Constr. new distribution system for water works Dist. No. 2; separate bids for material and construction; 780 tons c. i. pipe and special castings: about 40,000 ft. of 4 to 12-in. mains Laying about 10,200 ft. of 24-in. c.i. water pipe in Hyde Park av. Furn. and install. pump. equip. for village water works.....	John Thompson, Chm. Bd. Imp. Dexter Brackett, Chm. Engr. W. Wk. D. Donohue, City Clerk.
Minnesota.....	Paynesville.....	June 24, 2 p.m.....	Extending water mains, consisting of 3 blocks of 8-in. main with hydrants and connections.....	Frank Tolman, Village Clerk.
Ohio.....	Euclid.....	June 26, noon.....	Laying 6-in. water mains in four avenues.....	F. H. Schoaff, Village Clerk.
New York.....	Newburgh.....	June 26, 5 p.m.....	Laying about 1,000 ft. 30-in. water main.....	Curtis Stanton, Supt. Water Works.
Pennsylvania.....	Aliquippa.....	June 26.....	Constr. brick pump house, laying c. i. water lines and connecting 1,184,000 single action triplex power pump.....	W. W. Lester, Boro. Clerk.
Massachusetts.....	Lynn.....	June 27.....	Constr. pumping station and machinery for pumping water from Saugus River to Hawkes Pond.....	Ulman R. Hunt, Supt. Bldgs.
Michigan.....	Imlay City.....	June 27, noon.....	Wrecking old and constr. new standpipe on brick tower; and furn. c. i. riser pipe with connections complete.....	Horace Lamb, Pres. Bd. Trustees.
New Jersey.....	Bridgeton.....	June 27.....	Constructing complete pumping station and water filtration works, machinery, pumps, fillers, etc.....	J. J. Jones, City Clerk.
Kentucky.....	Frankfort.....	June 27, 11 a.m.....	Constr. pipe line to Lakeland, consisting of 7,360 ft. 16-in. pipe, 21,680 ft. 12-in. pipe, 10,690 ft. 8-in. pipe.....	Albert Scott, Pres. Ken. St. Bd. Con.
Tennessee.....	Dyer.....	June 27, 2 p.m.....	Furn. material for constructing water works; consisting of 60-H.P. gasoline engine; 150,000 gal. reservoir; 40,000 gal. steel tank on 50-ft. tower; brick or concrete pumping station; water pipe, valves, etc.....	R. B. Daniel, Mayor.
Maryland.....	Baltimore.....	June 28, 11 a.m.....	Furn. a 30,000,000 gal. vertical triple expansion pumping engine, two batteries and two boilers each and appurtenances	Alfred M. Quick, Water Engineer.
Quebec, Can.....	Montreal.....	June 29, noon.....	Installing pumping machinery, blower and cranes at filtration plant.....	L. N. Senecal, Secy. Bd. Comrs.
North Dakota.....	Mandan.....	June 29, 2 p.m.....	Laying c. i. water pipe and appurtenances, constr. power house intake, intake well, settling basins, clear water well etc.; furn. boilers; hydrants, valves, c. i. pipe and special castings	Lee Nichols, City Auditor.
Minnesota.....	Minneapolis.....	June 30.....	Furnishing filter equipment and devices.....	Henry N. Knott, City Clerk.
Nebraska.....	Bridgeport.....	June 30.....	Constr. water works system. Est. cost \$17,500.....	Village Clerk.
Ontario, Can.....	Ft. William.....	July 1.....	Selling equipment of municipal pumping and electrical generating plant, suitable for town of 5,000 inhabitants.....	John Wilson, City Engineer.
Illinois.....	Mendota.....	July 3, 7:30 p.m.....	Constr. an iron and concrete roof on reservoir.....	City Clerk.
Ohio.....	Cleveland Hghts.....	July 5, noon.....	Building 10-in. water main in Cedar Roads.....	H. H. Canfield, City Clerk.
Louisiana.....	Kentwood.....	July 6.....	Drilling artesian well.....	W. D. Welsh, Mayor.
Nebraska.....	Columbus.....	July 7, 8 p.m.....	Constructing and installing a water works extension.....	City Clerk.
Quebec, Can.....	Montreal.....	July 13, noon.....	Constr. final filters and appur. forming por. of filtration plant.....	L. N. Senecal, Secy. Bd. Comrs.
BRIDGES				
Illinois.....	Clinton.....	June 23, 9 a.m.....	Constr. a reinforced concrete bridge of two 40-ft. girder type spans with an 18-ft. roadway.....	R. S. McBride, Town Clerk.
Ohio.....	Cincinnati.....	June 23, noon.....	Constr. bridges, culverts and approaches on County Club road in Sycamore, Silverton and Columbia townships.....	Stanley Struble, Pres. Bd. Co. Comrs.
Virginia.....	Rocky Mount.....	June 24.....	Constr. two bridges in Franklin County, of iron.....	J. H. Ferguson, Chm. Bridge Com.
Tennessee.....	Knoxville.....	June 24, 9 p.m.....	Rebuilding and repairing timber bridges in Knox County.....	L. L. Callison, Supt. Road Co.
Pennsylvania.....	Erie.....	June 26, 8 p.m.....	Reconstructing and repairing the 26th St. bridge over Mill Creek.....	Thomas Hanlon, City Clerk.
Washington.....	Tacoma.....	June 26, noon.....	Constr. new bridges on 11th st. Separate bids on (1) substructure; (2) entire bridge except steel work, electrical and other machinery; (3) Furn. metal work, electrical equipment; (4) Erecting superstructure; (5) Constr. bridge complete, removing old bridges constr. temporary bridge.....	City Clerk.
Ohio.....	Cleveland.....	June 28, 11 a.m.....	Constr. a concrete bridge in Euclid township.....	John F. Goldenbogen, Clk. B. C. C.
Texas.....	Houston.....	July 1.....	Constr. a reinforced concrete viaduct over Houston ship channel about 1,650 ft. long and 60 ft. wide.....	F. L. Dormant, City Engr.
Pennsylvania.....	Pittsburg.....	July 1.....	Constructing one concrete arch, estimated cost \$85,000.....	City Clerk.
Pennsylvania.....	E. Stroudsburg.....	July 3, 11 a.m.....	Constructing 4 stone bridges.....	Jos. Overfield, Clk. Bd. Co. Comrs.
Kansas.....	Leavenworth.....	July 3, noon.....	Building Peterson Bridge, Tonganoxie Twp.; bridge on Limit St., Leavenworth; bridge across Little Stranger, High Prairie township.....	J. A. Hall, County Clerk.
California.....	San Jose.....	July 5, 11 a.m.....	Constr. a pony truss bridge over Campbell Creek; also reinforced conc. add. to the abut. of Ford Road Bdge. over Coyote Creek.....	Henry A. Pfister, Clk. B. C. Sup.
Ohio.....	Cincinnati.....	July 7, noon.....	Constr. concrete bridge at intersection of German and Compton roads in Springfield township.....	Stanley Struble, Pres. Bd. Co. Comrs.
Indiana.....	Richmond.....	July 8, 11 a.m.....	Constr. a 24-ft. concrete span bridge in Green Twp.; an 18-ft. span on the Cart Road North of Richmond; constr. a concrete floor on the Canal Bridge at Hagerstown; constr. concrete crete wall and earth filled approach of the Middleboro Bridge.....	Demas S. Coe, County Auditor.
New Jersey.....	Trenton.....	July 11.....	Constr. a steel and conc. bridge over Herrontown Rd., Princetown township.....	Frank J. Eppele, County Engineer.
Indiana.....	Ft. Wayne.....	July 12, 10 a.m.....	Constr. a bridge over St. Joe River, at Tennessee ave.....	Calvin H. Brown, County Auditor.
LIGHTING AND POWER				
Wisconsin.....	Minocqua.....	June 23, noon.....	Constr. electric lighting plant, including engine and equipment. reconstr. build. for power house; pole line and wiring.....	W. H. Fisher, Town Chairman.
Sask., Can.....	Prince Albert.....	June 26.....	Furn. hydraulic power and electrical power equipment.....	C. O. Davidson, Secy.-Treas.
Iowa.....	Pocahontas.....	June 27, 4 p.m.....	Installing complete electric light plant.....	Geo. Schneiders, City Clerk.
Arkansas.....	England.....	July 1.....	Building and operating an electric light plant under a 30-year franchise.....	H. Galloway, Recorder.
Alberta, Can.....	Stettler.....	July 3.....	Furn. one 125 KVA generator exciter and switchboard; one tandem compound steam engine, boiler, stack, poles, and pole line material; erecting pole line.....	David Mitchell, Town Clerk.
Australia.....	Brisbane.....	Jan. 30, noon.....	Designs, supply and erection at Mount Crosby Pumping Station of alternatively one, two and three complete units consisting of power generating pumps and plants, etc.....	Geo. Johnston, Albert St., S.&W. Bd
FIRE EQUIPMENT				
New Jersey.....	Princeton.....	July 5.....	Furn. auto pumping engine.....	E. M. Updike, Chm. F. & W. Com.
South Dakota.....	Gettysburg.....	July 11, 8 p.m.....	Furn. 750 ft. of 2½-in. fire hose; one service hose cart.....	R. L. Flickinger, City Auditor.

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
MISCELLANEOUS				
Massachusetts	Holyoke	June 23, 2 p.m.	Constructing shelter for public playground	Oscar C. Ferry, Assistant Clerk
Indiana	South Bend	June 26, 10 a.m.	Furn. 50 or more voting machines	John W. Harbo, Auditor
Ohio	Maumee	June 26, noon	Erecting a village hall building	Geo. V. Raab, Village Clerk
North Dakota	Bismark	June 26, 9 p.m.	Erecting a brick fire hall	R. H. Thistlewaite, City Auditor
Oklahoma	Muskogee	June 27, 10 a.m.	Constr. garbage disposal plant of 35-ton daily capacity	Ernest Cook, Comr. Pub. Safety
New Jersey	Paterson	June 28	Collecting and disposing of garbage and refuse for term of 5 years from July 1	T. S. Standeven, City Clerk
Ontario, Can.	Ft. William	June 30, 5 p.m.	Constructing a reinforced concrete subway	John Wilson, City Engineer
Washington	Spokane	June 30	Constructing additions to country jail. Estimated cost \$40,000	Bd. County Comrs.
Illinois	Mendota	July 3	Constr. an iron and concrete roof on reservoir	City Clerk
Illinois	Gillespie	July 5, 5 p.m.	Constructing new city building	G. W. Schmidt, City Clerk
Indiana	Muncie	July 5	Constructing a new barn at County Infirmary, 40x50 ft.	County Auditor
Louisiana	Mansfield	July 5, 10 a.m.	Erecting a two story and basement, semi-fireproof Courthouse	Parish of De Sota

STREET IMPROVEMENTS

Clanton, Ala.—Chilton County is considering \$150,000 bond issue for road construction.

Argenta, Ark.—Plans are being prepared by E. A. Kingsley, engineer, Little Rock, for paving in districts 11 and 12.

Napa, Cal.—Trustees have ordered the City Engineer to draw up plans and specifications for bituminizing of five blocks of street at a cost of \$6,500.

Yuba City, Cal.—Board of Supervisors has granted the petition of J. W. More and others for a new road in District No. 2.

Colorado Springs, Col.—Specifications have been completed for the paving of downtown district and estimates and assessment lists are now being prepared.

Rockville, Conn.—Council has decided to lay macadam on East Main St.; \$4,000 available.

Washington, D. C.—The Secretary of War and the Chief of Engineers of Army, as members of the highway commission of the District, have finally approved revised plans made by District Commissioners of the system of highways for that portion of the District lying between Mount Pleasant st., Irving st., Adams Mills road, Quarry road and Columbia road.

Jacksonville, Fla.—Duval County will at once pave three miles of the John Anderson boulevard with brick; when work is finished contract will be awarded for three additional miles.

Key West, Fla.—Board of Council has passed ordinances for improvement of about ten streets.

Palatka, Fla.—Freeholders will vote July 11 on \$15,000 loan to complete paving of city with vitrified brick.

Albany, Ga.—Citizens have voted \$12,500 bonds for street paving and \$5,000 to open and lay out new streets.

Oglethorpe, Ga.—Macon County will vote July 20 on \$150,000 bonds for road construction.

Pembroke, Ga.—Bryan County will construct road from Moore's bridge across Canoochee River to King's Ferry bridge, across Ogeechee River.

Waycross, Ga.—Street extensions and subway construction involving several thousand dollars have been authorized by Council, with view of connecting all sections of city and eliminating railroad division now existing.

Muncie, Ind.—Board of Works has decided to pave Franklin st. with brick; bids will be asked.

Vincennes, Ind.—Cost of improving Sixth St. has been estimated at \$6,749.80.

Shenandoah, Ia.—City will construct 24,000 sq. yds. of asphaltic concrete paving this summer. F. L. Cain, City Engineer.

Lafayette, La.—Council has authorized Street Committee to advertise for bids to grade and keep streets and bridges in repair.

Hyattsville, Md.—Council has passed ordinance for improvement of Ralston and Wine aves.

Detroit, Mich.—Bids will soon be asked for paving five alleys at cost of \$30,000. J. J. Hoarer, Commissioner of Public Works.

Monroe, Mich.—Council has decided to pave Washington and North Macomb sts.; cost about \$18,000. J. M. White, City Engineer.

St. Cloud, Minn.—M. J. Cleveland, State Highway Engineer, Stearns County, has completed preliminary survey of State road leading from this city to Maine Prairie and Kimball, and is now working on plans and specifications for improving about 1,300 feet of the road.

Iuka, Miss.—Road Commissioners of District No. 1, Tishomingo County, are considering \$35,000 bond issue for road construction.—R. W. Carter, W. L. Goodman and E. F. Parnell, Road Commissioners.

Jackson, Miss.—Citizens will vote June 29 on \$85,000 bonds for paving streets, etc.—A. C. Crowder, Mayor.

Meridian, Miss.—Board of Supervisors of Lauderdale County have sold \$150,000 good roads bonds of District No. 1 to Union Bank and Trust Company, city.

Wiggins, Miss.—Town is considering \$5,000 bond issue for street improvements.

Excelsior Springs, Mo.—Excelsior Springs Road District of Clay County will vote July 29 on \$150,000 bonds for construction of macadam roads.

Trenton, N. J.—County Engineer Frank J. Eppel has completed specifications to be used in resurfacing of Trenton and Lawrenceville Road.

Binghamton, N. Y.—Citizens have voted to construct pavement on Main st.

Brooklyn, N. Y.—Borough President Alfred E. Steers is considering a plan for improvement and widening of Kings Highway; proposed to make the highway 100 ft. wide from Ocean Parkway to Flatbush ave.

Geddes, N. Y.—Citizens have voted \$60,000 to lay out highway from Solvay village to fair grounds, including bridge.

Seneca Falls, N. Y.—Citizens will vote June 27 on \$81,000 bonds to pave streets.

Yonkers, N. Y.—Mayor Lennon has suggested extension of School st.

Lillington, N. C.—Harnett County will vote July 27 on \$100,000 bonds for road construction.

Cincinnati, O.—Council has ordered estimate of cost of improving Sauer ave. with brick and Spring st. with asphalt; the director of Service has submitted approximate estimate of cost of improving Elliott st. Sycamore to Broadway, granite blocks, \$3,994.50; also total costs of improving Plum st., Court to South Canal st., granite blocks, \$5,615.73, and Otte ave., Hamilton ave. to ravine East of Kirby road, \$4,647.46.

Findlay, O.—Council has decided to repave Main St. at cost of \$40,000.

Erie, Pa.—Data will be prepared for grading, curbing and paving Fourth St.

Pittsburg, Pa.—Mayor W. A. Magee has recommended elimination of grade crossings, extension of Morewood Ave. and improvement of streets.

Aiken, S. C.—Council has decided to pave Laurens St.

Chattanooga, Tenn.—City will receive bids July 12, 3 p. m., for \$45,000 paving bonds.—T. C. Thompson, Mayor.

Rutledge, Tenn.—Grainger County Commissioners have authorized issuance of \$100,000 road bonds.

Brady, Tex.—Brady Precinct has again voted \$75,000 bonds for road purposes.

Dallas, Tex.—Dallas County will vote July 22 on \$500,000 bonds to build road.

Dallas, Tex.—Specifications have been adopted for paving of North Akard St. extension from Caruth to McKinney Av.

Granger, Tex.—Citizens have voted \$100,000 bonds for macadamizing roads.

Farmington, Utah.—Davis County is planning to expend \$35,000 in road improvements.

Alexandria, Va.—Cost of constructing macadam roadway on Columbus and Henry sts. has been estimated at \$4,000.

Seattle, Wash.—Cost of grading Thirty-seventh st. has been estimated at \$1,350; asphalt of Harvard ave., North, \$8,500, and grading Ninth ave., West, \$40,400.

Seattle, Wash.—Bids have been rejected for planking Grand Boulevard; Donaldson & Johnson low bidders, \$14,889.66.

Tacoma, Wash.—Municipal Commission is considering improvement of four streets.

Luxembourg, Wis.—Town Board has decided to grade Main St.

CONTRACTS AWARDED

Gadsden, Ala.—To C. O. Duncan for constructing sidewalks on 3d St., \$5,999.10.

Riverside, Cal.—To Jos. M. Shull for paving Denton St., \$5,652.

Thompsonville, Conn.—Repaving and macadamizing Pearl and South Pearl sts.,

about 11,000 sq. yds., to Amos D. Dridge's Sons, Inc., 97 cts. per sq. yd.

Denver, Col.—By Board of Public Works for paving Broadway, requiring 20,033 sq. yd. bituminous macadam, 2,684 sq. yd. brick, 1,391 lin. ft. sandstone curbing, to Municipal Constr. Co., \$63,424; paving Montview Boule., 24th Ave. and Jasmine Sts., to Denver & Pueblo Constr. Co., Railroad Bldg., \$45,319.

Gilman, Ill.—Paving Central st., to G. W. Prutsman, Danville, \$11,204.

Sterling, Ill.—By Board of Local Improvements for paving of West Tenth St. with Purington repressed brick, No. 1, to McCarty & Fitzgerald, \$1.33 per yd.

Brazil, Ind.—To Allen M. Shattuck for the construction of Hendrix gravel road, including a portion of Hendrix st.

Delphi, Ind.—By Carroll County Commissioners for constructing a gravel road to James F. Pierce, Delphi, \$10,000.

Greencastle, Ind.—By Commissioners of Putnam County for construction of Webster gravel road, 10,616 ft. in length, and Carrigan gravel road, about two miles in length, to James F. Carran, \$8,472 and \$7,820.

Kokomo, Ind.—Constructing two gravel roads, to Silas Sproal, \$14,201.

Laporte, Ind.—To John G. Young, for building of three miles of improved highway in Springfield Township, \$18,000.

Mt. Vernon, Ind.—Gravel roads as follows: To White & Eigenmann, the Dr. R. E. Wilson extension in Lynn Township, \$5,941; Miner M. Fairchild extension in Robb Township, \$4,900; to Mt. Vernon Construction Company, the Tim Crunk extension in Marry Township, \$7,950; road No. 6 in Smith Township, \$698; to S. A. Gano Company, road No. 1 in Center Township, \$8,154; to Samuel R. Adams & Co., of Princeton, for Smith Township, No. 1, \$11,693; No. 2, \$10,048; No. 3, \$3,360; No. 4, \$2,417; No. 5, \$941; to Campbell & Hawkins, Brazil, Ind., for Center Township, No. 2, \$8,211; No. 3, \$1,898; No. 4, \$8,989; No. 5, \$7,775; No. 6, \$1,998; No. 7, \$2,991.

Princeton, Ind.—Six rock road extensions in Gibson county, aggregating \$25,400, to S. R. Adams, city; Edgar Mauck extension, Center Township, \$3,420; Edgar Mauck extension No. 2, Center Township, \$3,963; Mont. Campbell extension, Columbia Township, \$3,697; Theodore Dougan extension, Columbia Township, \$5,237; Wm. Cassidy extension, White River Township, \$54,720; the James W. Bruner extension, White River Township, to Ewing Shields, Seymour, \$4,636.

Rushville, Ind.—Constructing Beckner road, to Wilk & Co., \$8,700.

Wabash, Ind.—Road construction: to H. B. Stark & Co., Bluffton, Creager road, three miles, gravel, \$5,689; Creager road, three miles, stone, \$8,750; to D. P. Brooks, W. H. Miller road, stone, \$2,090; to F. O. North, Murphy road, stone, \$10,349; to George M. Sewell, Noble Township, gravel \$7,400; to Fred A. Grover & Co., Logansport, Tyner road, between Waltz and Liberty and Noble Townships, stone and gravel, \$10,738.

Washington, Ia.—Paving with brick N. Iowa Ave. to J. J. McKeon, Washington, \$2.06 per sq. yd.

Covington, Ky.—To E. J. Ruh Co. for paving with asphalt portions of 5th and Madison Sts.; paving 13th and 20th Sts. to J. Sullivan, 22d and Howell Sts., and Ed J. McKenna, 18th and Greenup Sts., \$2,762 and \$3,977 respectively.

Boston, Mass.—To William J. Rafferty Co. for edgestones, gutters and sidewalks in Hewlett St., between Walter and Centre Sts., \$9,452.25. Other bidders: R. J. Young & Co., \$8,603.75; John Kelly & Co., \$10,061.25; John McCourt & Co., \$10,170.90; West Roxbury Trap Rock Co., \$10,907.75; engineers' estimate, \$10,200. R. J. Young & Co. failed to submit a price on item No. 1; to R. J. Young & Co. for constructing macadam roadway in Quint Ave., Brighton, \$4,952.80; other bidders, John Kelly & Co.,

\$5,380.90; Jeremiah J. Sullivan, \$6,156.50; engineers' estimate was \$9,500, which included cost of materials furnished by city and also the engineering expense; to James Doherty for grading, edgestones, gutters and crosswalks in Flint St., between Norfolk St. and New England Railroad, \$999.40; other bidders, F. S. & A. D. Gore Corporation, \$1,056.35; Connolly & Diamond, \$1,188.20; Daniel E. Lynch, \$1,196.70; engineers' estimate, \$1,200.

Boston, Mass.—Building State highways by the State: Town of Bourne, to M. J. Denault & Co., Lowell, \$8,529; other bidders, Thomas Whelan & Co., Wollaston, \$8,673; Lane Quarry Co., Hingham, \$8,733; H. L. Thomas, Middlesex, \$9,213; Frank Williams, Boston, \$9,832. Town of Dennis: to William Sears, \$3,850. Town of Groveland, to James E. Watkins, \$7,961; other bidders: F. J. Mague, West Newton, \$10,552; John G. Gaffery, Medford, \$11,578; M. L. Camarco, Lee, \$12,105; Hul Construction Co., Boston, \$12,967. Town of Holyoke, to H. L. Thomas, Middleboro, \$3,005. Town of Ipswich, to James E. Watkins, \$5,064. Constructing 17,000 ft. of gravel road in Town of Hancock, to Crow & Walsh, Pittsfield, Mass., \$14,077; other bidders: M. L. Camarco, Lee, \$14,919; J. W. Polcaro, Pittsfield, \$16,347; F. J. Mague, West Newton, \$17,541.

Holyoke, Mass.—To Hassam Paving Co. for proposed work on Main St.

Lynn, Mass.—To David J. Sheehan Co. to pave Essex St., from Chatham St. to Eastern Ave., area of 7,400 sq. yd., \$1.70 sq. yd.; Willow, Pearl and Tremont Sts., aggregating area of 7,100 sq. yd., will be paved by the Shawmut Construction Co., \$1.65 sq. yd.; to the Connecticut Hassam Paving Co. for Oxford St., containing 5,500 sq. yd., \$1.75 sq. yd.

Lynn, Mass.—Building roads to Michael McDonough, of Swampscott, \$5,180; other bidders, John Cudihy, of Marblehead, \$6,012; David J. Sheehan, of Lynn, \$7,500; Essex Traprock Company, of Peabody; Fred E. Ellis, \$7,980.

Detroit, Mich.—Paving with cedar block on concrete foundation: To F. Porbath & Sons, Penobscot Bldg., Willis ave., from Hastings to Russel, \$7,948; 24th st., from Fort to Howard st., \$4,607; 24th st., from Porter to Baker st., \$4,293; to Julius Porbath, McGraw Bldg., Buchanan st., from 14th to railroad tracks, \$14,255; Provard st., from Elliott to Canfield st., \$11,535; Madison ave., from Brush to Beaubien st., \$1,581 to J. A. Affeld, 761 Campbell ave., 21st st., from Fort to Baker st., \$11,668; to J. A. Mercier, Hammond Bldg., Plumb st., from Second to Fifth ave., \$4,595; Bethune ave., from Woodward ave. to Beaubien st., \$8,062; to Thos. E. Currie, McGraw Bldg., Orleans st., Sections 1 and 2, \$18,000; Waterloo st., from east end to Joseph Campeau ave., \$12,076.

Columbus, Miss.—To McLeod & Baskerville, Macon, for concrete curb and gutter and storm sewers, about \$10,000.—C. L. Wood, engineer.

Gulfport, Miss.—By Harrison County Supervisors to W. A. Hughston to construct 2.8-10 miles of gravel road and 15 4-10 miles of dirt roads in District No. 2, \$27,300.—W. A. Griffith, Secretary, Road Commissioners' District No. 2.

Atlantic City, N. J.—Paving New Jersey and Massachusetts and other avenues, to United Paving Co., \$10,116.15 and \$29,614.

Cape May, N. J.—Building 6½ miles of Seashore road, to Frank W. Miller, Cape May, C. H., \$24,752.

Albany, N. Y.—Paving Morris St. from West Lawrence St. to Allen St. to Mulderry Bros., \$10,410.60; paving King Ave. from Central Ave. to Bradford St. to John M. Holler, \$12,275.75.

Albany, N. Y.—Good roads contracts, aggregating over \$900,000: Road No. 948, Voorheesville-New Salem, Albany County, 3.76 miles, to J. and T. Murphy, Cobleskill, \$41,684; No. 5129, Allegheny County, to P. H. Murray, Rochester, \$52,450; No. 5148, Part 3, Broome County, to Andrew B. Young, Brooklyn, \$44,026.30; No. 5141, Part 1, Cortland County, to S. F. Hull, Cortland, \$23,568.32; No. 5136, Dutchess County, to Harvey D. Sproul, Inc., Peekskill, \$52,890; No. 5154, Dutchess County, to Schunermunk Construction Company, Highland Hills, \$46,950; No. 5150, Dutchess County, Part 5, to Harvey B. Sproul, Inc., Poughkeepsie, \$39,641; Road No. 925, Erie County, to Busch and Percival, Buffalo, \$47,989; Road No. 5136 Genesee County, to Thomas Grady, Rochester, \$25,700; Road No. 5159, Herkimer County, to the State Highway Construction Company, Albany, \$5,555.90; Road No. 5152, Jefferson County, to Burns Bros. & Haley, Watertown, \$7,267; Road No. 937, Lewis County, to the St. Regis Construction Company, Malone, \$40,940.64; Road No. 5142, Livingston County, Part 1, to Frank L. Cohen, Buffalo, \$41,000; Road No. 908, Madison County, to R. W. Enison, Geneva, \$53,121; Schenectady County Line-Scotch Bush, Montgomery County, road No. 943,

to John Allen, Schenectady, \$14,111.93; Road No. 749, Niagara County, to Brooks & Julien, Rochester, \$119,000; Road No. 5139, Part 2, Oneida County, to Newport Construction Company, Newport, N. Y., \$76,265; Road No. 932, Oneida County, to T. F. Shaughnessy & Company, Albany, \$14,300; Road No. 5143, Part 2, Onondaga County, to Daniel L. Mott, Utica, \$55,790.60; Road No. 934, Otsego County, to D. I. Snell & Company, Canajoharie, \$49,436.10; Road No. 5138, Otsego County, Part 4, to John and Thomas Murphy, Cobleskill, \$16,673.55; Road No. 910, Suffolk County, to Clancy & Van Alst, Astoria, \$38,826.76.

Brooklyn, N. Y.—Regulating, grading, curbing, recuring, flagging and resetting manhole covers in Weirfield St., Ridgewood, to Charles A. Meyers, \$5,793.20; repaving with asphalt macadam, Broadway, Flushing, from Murray Lane to Tenth St., Bay Side, to Long & Miller, \$22,630; also for Astoria Ave., from Nineteenth to Jackson, Corona, \$22,416; to Clancy & Van Alst for repaving with asphalt macadam Central Ave., Springfield, from Merrick Rd. to city line, at \$24,806, and Cooper Ave., from Myrtle Ave. to Edsall, at \$3,877.50; Hastings Pavement Co. was lowest bidder for paving with asphalt blocks on concrete foundation Academy St., from Webster Ave. to Washington St., Long Island City, at \$5,695.60.

Herkimer, N. Y.—Paving of South Washington St. to B. Manion and D. F. Strobel.

New York, N. Y.—Regulating and repaving with wood block pavement to U. S. Wood Preserving Co., 165 Broadway; Ave. B, \$30,772; Ave. C, \$33,741.

Rochester, N. Y.—Brick pavement on Cutler St. to Thomas Holahan, \$4,797; cement walks on Bradley St. to Henry Schrenfeldt, \$296.25.

Schenectady, N. Y.—Paving Wabash Ave. to Schenectady Paving Co. for bitulithic.

Syracuse, N. Y.—Paving Onondaga St. with Trinidad asphalt to Warner-Quinlan Asphalt Co., \$25,564.15.

Canton, O.—To Frank A. Downs, Canton, for paving the Canton-North Industry Rd., \$29,397.30. Other bidders: P. Dieffenbacher & Sons, \$29,730.86; Pres Campbell, \$30,276.46; William H. Stanton, \$33,794.33; Wise, Smith & Krabill, \$33,804.60; R. C. Roush, \$34,228.88; Piere & Talerice, \$34,549.30; Peter Hahn & Son, \$34,421.08; engineers' estimate, \$30,893.72.

Cincinnati, O.—To William P. Flynn for the improvement of Springfield pike, from Gas Hall in Carthage to the C. & H. & D. R. R. in Hartwell, \$4,122; estimated cost was \$5,311.

Cincinnati, O.—By Board of Control for paving with granite Spring Grove Ave. from Knowlton's Corner to entrance of Spring Grove Cemetery to J. M. Quill, \$95,780; City Engineer's estimate for the work, \$116,140.

Dayton, O.—Paving Lexington Ave., Broadway to Deal, with brick to J. E. Conley, \$28,520.

Dayton, O.—Paving Summit st. from 3d to Germantown sts., to the Warren Brothers' Paving Company, \$21,404.20.

Ft. Recovery, O.—Paving Wayne & Wiggs sts. to Lowry, Mannix and Hays, \$36,202.35 and \$6,786.30.

Greenville, O.—Building roads: Duncan road, Brown Township, to J. R. Smith, labor, \$5,890, and to Greenville Gravel Co., material, \$4,490; Monnel road, Mississinawa Township, to G. A. Warner, labor, \$13,598, and to Albert Shafer, material, \$2,300; W. R. Little road, Allen Township, to Manning & Walls, labor, \$3,483, and to Greenville Gravel Co., material, \$5,220; Hemelgarn road, Allen Township, to J. F. Hemelgarn, labor, \$1,398, and to Greenville Gravel Co., material, \$2,595.

Baker, Ore.—To Warren Construction Co. to lay 3 miles of pavement, \$2.02 sq. yd.

Altoona, Pa.—To Wm. M. Elder, Baltimore, Md., for resurfacing paved streets with Texaco asphalt.

Edgeworth, Pa.—Improving Woodland Ave. with Kentucky rock asphalt, requiring about 5,200 sq. yd. pavt., 4,700 lin. ft. concrete curb and gutter, etc., to McPherson Bros., Edgeworth.—L. D. Tracy, 245 4th Ave., Pittsburg, borough engineer.

Erie, Pa.—Paving Poplar St. 2d to Park Aves., to John McCormick & Sons; paving East Ave. to Mayer Bros., 1 per sheet asphalt; grading, curbing and paving 20th St. to J. & M. Doyle, 1.27 for asphalt.

Greensburg, Pa.—Laying one mile of paving to Luther F. Edwards, Yardley, \$22,212.

Meadville, Pa.—Paving Center St. to G. M. Harris, Jamestown block, \$1.61; native stone curb, 54c.

Warren, Pa.—Constructing a State road, 2½ miles long, in Pine Grove Township, to South Shore Construction Co., Erie.

Knoxville, Tenn.—Paving Dist. Nos. 89, 90, 91, 93 and 94 to Barber Asphalt Co., about \$100,000.

Salt Lake City, Utah.—Sidewalk extension No. 129 to McKay & Reed, \$86,180.93;

curb and gutter extension No. 16 to Gillis Construction Co., \$9,267.41.

Chehalis, Wash.—To Alfred & James to grade and macadam part 6th St. and Adams Ave., \$2,600.

Seattle, Wash.—Grading 25th Ave. N. W., to J. H. Cullen, 6020 Third ave. N. W., \$18,910.50; paving Ellicott ave., to F. McClellan, Sullivan Bldg., \$192,961.

Minnedosa, Man., Can.—To A. E. Dobson, Deloraine, Man., for about 35,000 sq. ft. of granolithic sidewalks, 20 cts. per ft.

Quebec, Ont., Can.—Paving number of streets with asphalt, to Falardeau & Co., about \$147,000.

BIDS RECEIVED

Washington, D. C.—Furnishing repressed vitrified paving block during the fiscal year ending June 30, 1912, as follows: Proposal (A) furnishing 2,133,000 repressed vitrified paving blocks, subject to an increase or decrease of one-third; alternate (B) 1,600,000 paving blocks, with the right to order any quantity in excess of that named as the needs of the service may require: American Sewer Pipe Co., Akron, Ohio, (A) \$21.25, (B) \$23.40; alternate (A) \$21.25; alternate (B) \$23.40. Baltimore Clay Products Co., Baltimore, Md., (A) \$21; (B) \$21. Allegheny Valley Brick Co., Tarentum, Pa., (A) \$19.50; (B) \$19.75. Mack Mfg. Co., Philadelphia, Pa., (A) \$22.55; (B) \$22.55; alternate (A) \$24.80; (B) \$24.80. Saxton Vitrified Brick Co., Saxton, Pa., (A) \$23.50; (B) \$23.50. C. P. Mayer Brick Co., Bridgeville, Pa., (A) \$21.40; (B) \$21.40; Layton Fire Clay Co., McKeesport, Pa. (A) \$21.50; (B) \$21.50. William Wirt Clark, Baltimore, Md., (A) \$23.90; (B) \$23.90.

Camden, N. J.—Resurfacing Camden and Westfield turnpike from Twenty-seventh st. to county line, W. Penn. Corson and the Feeley-Kelly Co. each offered to do work for \$38,702.80; Edward M. and Frank W. Miller, of Cape May, were low, \$36,412.24; award deferred until June 28.

Woodbridge, N. J.—Improving Holton St. and Cliff Road: J. C. Fowler, \$1,869.45; Liddle and Pfeiffer, \$2,038.85; Collins and Gundrum, \$2,473.51. Mutton Hollow Road: J. C. Fowler, \$2,443.29; Collins & Gundrum, \$3,979.38; John Quinlan, \$3,350.01; F. R. Edgar, \$2,821.92; J. C. Fowler, \$2,055; F. R. Edgar, \$2,437.

Salt Lake City, Utah.—Sidewalk extension No. 129 to include 522,729 sq. ft. 4-in. and 11,195 ft. 6-in. cement walk, 24,903 cu. yd. excav., furnishing and laying 4 to 18-in. vitr. pipe: McKay & Reed, \$86,181; Gillis Constr. Co., \$86,281; Jas. Kennedy Constr. Co., \$92,977; Strange & Maguire Constr. Co., \$102,651; Benj. F. Tibby, \$110,895. For curb and gutter extension No. 16: Gillis Constr. Co., \$9,267; McKay & Reed, \$10,561; Strange & Maguire, \$10,960; C. E. Palm, \$11,010; Gilkerson Constr. Co., \$11,171; P. J. Moran, \$12,357; A. A. Clark, \$12,925.

SEWERAGE

Phoenix, Ariz.—Council has rejected only bid received for construction of sewer system.

Washington, D. C.—District Commissioners have ordered extension of sewers in three streets.

St. Petersburg, Fla.—City Engineer M. W. Spencer has asked for addresses of firms who can construct a sewage disposal plant for a city of 5,000 population.

Albany, Ga.—Citizens have voted \$12,500 bonds to improve and extend sewerage and water works system.

Hartwell, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for sewer and water works construction.

Lavonia, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for sewer construction.

Tallahassee, Fla.—City is having plans prepared for sewer and water improvements by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Winder, Ga.—City has selected J. B. McCrary Co., Empire Bldg., Atlanta, Ga., as Consulting Engineer for sewer system.

Crawfordsville, Ind.—City will construct 2400 ft. 8 to 10-in. sanitary sewers.—H. C. McClure, City Civil Engineer. (Erroneously reported in issue of June 14.)

Gas City, Ind.—Council has instructed Paul Jones, Clerk, to advertise for bids for new sewer which will be constructed in alley between Main and South A Sts., from Second to Fourth.

Indianapolis, Ind.—City Engineer Klausmann has recommended to Board of Public Works that sewers be built in Lee St., from Morris St. to Jones St., and in Jones St., from Lee St. to Belmont Ave.

Girard, Kan.—Plans and specifications are being prepared for sanitary sewers and sewage purification works; bids will probably be received about Aug. 1.—Burns &

McDonnell, Scarrett Bldg., Kansas City, Mo., Engineers.

Camden, N. J.—Council has decided to construct sewer drains in Everett and 10th sts. A. L. Sayers, Street Commissioner.

Trenton, N. J.—Board of Health has recommended construction of sewer in Greenwood Ave. from Garfield Ave. to city line.

Binghamton, N. Y.—Bids will be asked for constructing sewers on Berlin, Union and Grace sts.

Illion, N. Y.—Board of Sewer Commissioners has accepted plans for Morgan St. sewer.

Palatine Bridge, N. Y.—Vrooman & Perry, of Gloversville, are preparing plans for sewer system and sewage plant.

Cincinnati, O.—Council has decided to construct 12-in. vit. pipe sewer in Sounders st., at cost of \$3,197; cost of constructing sewers in West Fork road has been estimated at \$11,170, and in Kinley alley and other streets, \$6,100; plans have been submitted for sewer Sixth ave. and Duck Creek road.

Toledo, O.—Board of Control has approved contract authorizing W. J. Sherman to secure necessary data on sewage in ten-mile and Swan Creeks, \$2,800.

Wilmington, O.—Council has retained Riggs & Sherman, Toledo, to make necessary surveys and plans for construction of sewerage system.

Edmond, Okla.—Citizens have voted \$20,000 sewer, water and light bonds.

Eugene, Ore.—City has sold \$28,000 bonds for installing two trunk sewers to Morris Bros.

Clearfield, Pa.—Council is asking for bids for preparation of plans for comprehensive sewer system and sewage disposal works. —J. D. Connelly, Clerk of Council.

Collingdale, Pa.—Borough Engineer Damon is preparing plans for erection of sewerage and sewage disposal works for portion of city.

East Stroudsburg, Pa.—Consulting Engineer Clyde Potts, 30 Church St., New York City, has been retained to design sewerage and sewage disposal works for portion of city.

East Washington, Pa.—Citizens have voted \$25,000 bonds for connecting borough with sewage disposal plant of Washington Borough.

Monaca, Pa.—Council has finally passed ordinance providing for extension of sewer system.

York, Pa.—Bids for construction of 510 ft. of sewers on Eighth ave. in North York will be invited soon by Council; Engineer R. B. McKinnon has completed specifications.

Phoebe, Va.—Upon recommendation of Committee on Sewers, Town Council has adopted resolution authorizing Committee to build a sewer along Armistead and Curry sts.

Walla Walla, Wash.—Council has established Sewer Districts No. 12 and 14.

Marlette, Wis.—Council has voted to appropriate \$9,000 for the extension of trunk sewer. J. L. Fisher, Mayor.

North Bay, Ont., Can.—Citizens have passed \$45,000 by law for sanitary and storm sewers.—T. N. Colgan, Commissioner of Works.

Oshawa, Ont., Can.—Town Engineer Frank Chappell is preparing plans for sewage disposal plant.

Simcoe, Ont., Can.—Engineers Chapman & Power, Natl. Bldg., Toronto, are preparing plans for sewage system and disposal plant.—W. C. McCall, Town Clerk.

St. John, N. B., Can.—City is considering construction of garbage disposal plant to cost \$50,000.—Wm. Murdock, Engineer.

CONTRACTS AWARDED

Danielson, Conn.—Laying 1700 ft. of 12-in. vitrified pipe sewer in Mechanic st., to E. A. Davis, \$1.74 per ft.

Hoopeston, Ill.—To Henry Rees, Quincy, for constructing proposed sewer system, \$48,000.

Tolleston, Ind.—To Michael Byrne, Gary, for construction of sewer system, \$165,698.

Easton, Md.—To John R. Jeffreys, Elberon, N. J., for constructing 8 miles of sewers, bids for which were opened on April 15.—Clyde Potts, 30 Church St., New York City, Supervising Engineer.

Adams, Mass.—Sewer and paving work has been awarded to the J. E. FitzGerald Co., of New London, Conn., \$10,090.—Lindholm & Tuller, Agricultural Bank Bldg., Pittsfield, Engineers.

Omaha, Neb.—To Jas. Jensen, 3024 24th St., for reconstruction of Burt St. main sewer, \$24,393, and construction of south-west branch of South Omaha main sewer, \$43,129.

Englewood, N. J.—By Englewood Sewerage Co. for complete construction of a sewage disposal works, to Atlantic Construction & Supply Co., Atlantic City, \$16,227; other bidders: P. H. Hennesy, Mt. Vernon, \$10,519; Cement Paving & Con-

struction Co., Jersey City, \$14,995; W. G. Broadhurst, Hackensack, \$16,370; Hard & Worm, New York, \$17,513; F. R. Long, Hackensack, \$19,197; J. W. Heller, Newark, N. J., \$20,545; Lewis & Perkins, New York, \$23,325; Ind. Eng. Co., New York, \$24,702; B. H. Brooks Co., New York, \$20,137. Clyde Potts, 30 Church st., New York, Engineer.

Erie, Pa.—To Clement Wolfran for building sewers in 20th St., \$1.09 per ft. for 9-in. pipe; 23d St., 94c., and Pine Ave., \$1.25; sewer in 25th St. to John McCormick & Sons, \$1.25.

Pittsburg, Pa.—Reconstruction of Troy St. drainage basin to the M. O'Herron Co., \$113,746.

Dallas, Tex.—Furnishing inlet grates for storm sewer work to Mosher Manufacturing Co., \$6.90 each.

Salt Lake City, Utah.—Building sewer extensions Nos. 287 and 248 to Jas. Kennedy Construction Co., \$1.07 and \$1.29 per lin. ft.

Richmond, Va.—To I. J. Smith & Co., Inc., for constructing deep sewer in Broad st., \$6,346.70.

Seattle, Wash.—Building sewers on Ninth ave. N. E., to Kroch & Jessen, 4011 Greenwood ave., \$8,235.89.

WATER SUPPLY

Jackson, Ala.—Citizens will vote July 10 on bonds for constructing water works; if voted affirmatively city will furnish stand-pipe, mains and fire plugs and Bigbee Ice & Development Co. will supply water and pumping power.

Troy, Ala.—Council has ordered extension of sewerage system.

Long Beach, Cal.—Citizens will vote June 27 on municipal ownership of water works.

Oakdale, Cal.—Citizens have voted \$82,000 bonds for construction of water works and sewer system.

Bristol, Conn.—The Bristol Water Co. has decided to increase its capital from \$200,000 to \$300,000 for the improvement and development of storage facilities.

Delmar, Del.—Citizens have voted to install water works.

Milton, Del.—Bids will be received about July 6 for laying three miles of pipe, constructing a 75,000-gallon standpipe, sinking two wells, and constructing a pumping plant; estimated cost, \$14,000. G. E. A. Fairley, 511 Equitable Bldg., Baltimore, Md., Engineer.

Dayton Beach, Fla.—Citizens will soon vote on \$8,000 bonds to install water works system.

Albany, Ga.—Citizens have voted \$12,500 bonds to improve water works and sewerage systems.

Hartwell, Ga.—Water works plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Lavonia, Ga.—Water works plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Tallapoosa, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for water and sewer improvements.

Villa Rica, Ga.—City will construct water works; plans being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta.

Canton, Ill.—City has decided to purchase 2,000,000-gallon pump and an 800-ft. compressor. Joseph Waugh, City Clerk.

Moline, Ill.—Need of new boilers to cost \$15,000 at water works is being urged.

Virde, Ill.—City has decided to install waterworks system.

West Terre Haute, Ind.—Council is considering construction and equipment of waterworks plant.

Coin, Ia.—Citizens will vote June 27 on \$12,000 bonds for installation of water works system.

Worthington, Ia.—City is considering the construction of water tank.

Augusta, Kan.—City has decided to install filtration plant for waterworks system; cost, \$12,000.

Coffeyville, Kan.—Carl Stromquist, Superintendent Water & Light Department, has completed plans and specifications for improvement of the water system at cost of \$100,000, including filter plant and additional water mains.

Bad Axe, Mich.—Citizens have voted bonds to extend city water mains.

Detroit, Mich.—Water Board has asked for bids for 11,000 tons of iron pipe.

Barnesville, Minn.—All bids for extending water works have been rejected; city will do work by day labor.—M. P. Phillippi, City Clerk.

Montgomery, Minn.—Mathias Machacek, New Sprague, is preparing plans for construction of reservoir; J. W. Kaisersatt, City Clerk.

Red Wing, Minn.—City is considering construction of water mains.—A. E. Rhame, City Engineer.

McComb, Miss.—City is considering \$15,000 bond issue to improve and extend water works.

Festus, Mo.—Fuller, Coult Co., Chemical Bldg., St. Louis, Mo., consulting engineers, will prepare plans for construction of system of waterworks.

Crawford, Neb.—Issuance of \$24,000 bonds for establishment of gravity water system is being considered.

Milltown, N. J.—Installation of water works system is being considered. Address Mayor Richter.

Woodbury, N. J.—Citizens will soon vote on \$70,000 bonds to lay water mains.

Cornwall, N. Y.—Village has been authorized by State Water Commission to spend \$30,000 in constructing and additional storage reservoir.

Beach, N. D.—Bids will be received about July 1 for the construction of waterworks; W. Plomason, engineer.

Fremont, O.—Citizens will vote, July 11, on \$54,000 bonds for water main extensions and fire department improvements.

Toledo, O.—Service Director Cowell will prepare plans and specifications for connection of high pressure fire service pumping station.

Urbana, O.—Council has authorized Director of Public Service to engage consulting engineer in connection with proposed improvement of the waterworks system.

Berwyn, Okla.—Installation of \$3,500 water works system is being considered.

Custer, Okla.—Western Engineering Co., Oklahoma City, is preparing plans for water works and electric light plant; cost, about \$40,000.

Edmond, Okla.—Citizens have voted \$20,000 water, light and sewer bonds.

Nowata, Okla.—City has sold \$75,000 water works bonds to Spitzer, Rorick & Co., Toledo, O.

Bethlehem, Pa.—Citizens will vote in November on \$175,000 bonds to erect water plant.

Glen Rock, Pa.—Jacob H. Brillhart, 34 N. 7th Ave., Bethlehem, has been selected to prepare plans and specifications for additional water supply.

Shrewsbury, Pa.—City will construct waterworks improvements; \$12,000 bonds have been sold.

Greenville, Tenn.—Citizens have voted \$60,000 water and light bonds.

Dallas, Tex.—Plans are being considered by City Commissioners for connecting up of the cement plant wells, sinking of gang wells of shallow wells along line of the pipe to be laid, development of water gravel stratum west of the city and sinking of five or more artesian wells to wood-bine stratum along line of West Dallas gravel pit main.

Dallas, Tex.—Bids have been ordered by the Board of Municipal Commissioners for electric motors and belt-driven air compressors for the pumping of six artesian wells in center of city.

Denison, Tex.—Council has decided to immediately begin sinking of artesian well at the new pump station at Shawnee Reservoir.

Montpelier, Vt.—National Board of Fire Underwriters has recommended installation of additional water mains and hydrants.

Seattle, Wash.—Board of Public Works has adopted plans and specifications for floodgate at Lake Union plant.

Sparta, Wis.—City is considering laying 1400 ft. of 10-in., 400 ft. of 8-in., 750 ft. of 6-in., and 1200 ft. of 4-in. c.-i. water mains; C. H. Gregory, Superintendent Water Works.

North Bay, Ont., Can.—Citizens have passed \$100,000 by-laws for water works for city.—T. N. Colgan, Commissioner of Works.

West Lorne, Ont., Can.—F. W. Farncombe, London, is preparing plans for water works.

CONTRACTS AWARDED

San Francisco, Cal.—Completing laying of pipe for the auxiliary water system in district bounded by Market, Castro, 29th, Mission, 26th, Harrison and 11th Sts., to the Raisen Improv. Co., \$91,500.

Chicago, Ill.—Building foundations for pumps at 22d St. pumping station to Myron B. Reynolds, 4741 Kenmore Ave., \$9,500.

Joliet, Ill.—To Hill-Tripp Pump Co., of Anderson, Ind., for equipment of new city pumping station, \$5,985.

Stamford, Ill.—Building water works to C. C. Bowman, Bloomington, \$5,800; the work includes brick pumping station, pumping machinery, pump pit, hydro-pneumatic tank and a small system of water mains.

Seneca, Kan.—To Hybsman & Wiley for improvements to waterworks system, \$15,000; Burns & McDonnell, Scarritt Bldg., Kansas City, Mo., engineers.

Marquette, Mich.—Extending water system into lake to Wanless & King, Duluth, Minn., \$60,000.

Libby, Mont.—To Crane-Ordway Co., of Great Falls, for material for waterworks system; cost, \$18,000.

Bladen, Neb.—Furnishing c-i. pipe and specials to the American Cast Iron Pipe Co., Kansas City, Mo.; construction work was let to the Inter-Mountain Bridge and Construction Co., Tecumseh, Neb.—Charles Balderston, City Clerk.

Rahway, N. J.—By Pumping Station Committee for the erection of building to house new \$14,000 pump to be installed at the water works to E. F. Wilson, \$4,294.

Schenectady, N. Y.—Laying water mains in five streets to Thos. R. Crane.

Masontown, Pa.—Water filtration plant to the Pitt Constr. Co., Pittsburgh.—Chester & Fleming, Union Bank Bldg., Pittsburgh, Engineers.

Pittsburg, Pa.—To the Allis-Chalmers Co., Milwaukee, Wis., for furnishing 2 pumps for the new pumping station at filtration plant at \$102,810 each.

Newport, Tenn.—To the American Light and Water Co., Chicago, Ill., constructing gravity water system; daily capacity about 300,000 gallons, \$46,940; W. P. Bullock, Kansas City, Mo., engineer.

Fort Worth, Tex.—Constructing settling beds for use with proposed reservoir to Pittsburg Filter Manufacturing Co., \$69,983.

Dallas, Tex.—Erecting two boilers at White Rock pumping station to A. G. Wright for two Casey-Hedges Co. boilers, \$2,045.

Basin, Wyo.—Water works and electric light improvements to the Katz-Craig Contracting Co., Omaha, Neb., for entire work, \$58,582.72; includes American cast iron pipe, \$11,948.72; hydrants and valves, pumping and electrical machinery, \$12,250; other general bids on construction: Des Moines Bridge & Iron Works, \$30,890; W. D. Lovell, Minneapolis, \$30,996; Lindstrom & Oren, Billings, \$31,500; Bruer & Stanton, Basin, \$32,772; Tanner Bros., Webster, S. D., \$32,900.

LIGHTING AND POWER

Helena, Ark.—Plans and specifications have been completed by Scofield Eng. Co., Arcade Bldg., Philadelphia, Pa., for power house and equipment for Helena Gas & Electric Co.; bids are now being asked.

El Centro, Cal.—Imperial Valley Gas Co. is considering extending mains to Brawley, about 15 miles.

Fillmore, Cal.—Ventura County Power Co. is planning to rebuild transmission line.

Santa Barbara, Cal.—Santa Barbara Gas & Electric Co. is considering an increase in its bonded indebtedness from \$1,000,000 to \$2,000,000 for improvements.

Gunnison, Col.—Bids will be received about July 1 for purchase of \$90,000 bonds to be used for construction of water power plant to furnish water and power for domestic and commercial purposes.—M. J. Schmitz, Town Clerk.

Albany, Ga.—Citizens have voted \$50,000 bonds to erect municipal gas plant.

Colquitt, Ga.—Plans are being prepared by J. B. McCrary Co., 1311 Empire Bldg., Atlanta, for electric light plant.—P. E. Wilkin, Mayor.

Fort Wayne, Ind.—Board of Public Works has decided to ask for bids for furnishing lamp posts.

Hartford City, Ind.—Crescent Gas & Oil Co., of Hartford City, owned by T. N. Barnsdall, of Pittsburg, has been sold to J. L. McCullough, Marion, who will supply Hartford City with artificial gas, along with Fairmount, Gas City and other smaller cities; central point of manufacture will be Marion.

Takoma Park, Md.—Mayor W. G. Platt will confer with officials of Potomac Electric Power Co. with view to installing electric lamps; oil lamps are now used.

Marshall, Mich.—Commonwealth Power Co., of Jackson, is considering the construction of dam across Kalamazoo River, 6 miles from Marshall.

North Branch, Minn.—Village Council has granted electric light franchise to Eastern Minnesota Power Co., Pine City.

Billings, Mont.—Establishment of improvement district for decorative lighting purposes is being considered.

Fergus Falls, Mont.—Election on bonds for development of electric light plant is being considered.

Springfield, Mo.—Springfield Railway & Light Co. has issued \$30,000 of bonds for improvements and extension of system; betterments will include installation of turbine unit, doubling generating capacity of electric lighting system and additional gas producing equipment and extension of gas and electric distributing systems.

Custer, Okla.—Western Engineering Co., Oklahoma City, is preparing plans for electric light plant and water works; cost, about \$40,000.

Edmond, Okla.—Citizens have voted \$20,000 light, water and sewer bonds.

Eugene, Ore.—City has sold \$25,000 bonds for installation of electric street lighting system to Morris Bros.

Newberry, S. C.—Southern Power Co. has applied for franchise for transmission line from Newberry to Greenwood.

Custer, S. D.—Installation of electric system is being considered.

Plankinton, S. D.—W. A. Kuntz, Woolsey, has petitioned Council for franchise for electric light plant.

Greenville, Tenn.—Citizens have voted \$60,000 light and water plant.

Austin, Tex.—Austin Gas Light Co. will erect generator house, with elevator, tower and engine; cost, about \$12,000.

Bishop, Tex.—F. Z. Bishop, owner of local electric light plant, will enlarge same.

Loraine, Tex.—City is interested in establishment of electric light plant.—W. T. Mulin is interested.

Luling, Tex.—Luling Electric Light and Power Co. will enlarge and improve plant.

Richmond, Va.—Appalachian Power Co. will soon call for bids for machinery; Blackwell & Buck, 49 Wall st., New York, engineers.

Centralia, Wash.—Washington - Oregon Corporation, which owns local street car, power and water service, is about to install power plant at Kalama River at cost of \$750,000; pipe connection covering distance of 60 miles will be laid down to reach the power to twin cities of Centralia and Chehalis. Isaac Anderson, Tacoma, President.

Clarkston, Wash.—Council passed an ordinance granting to the Clarkston Improvement Co. right to construct an electric light and power system.

North Yakima, Wash.—Citizens will vote July 1 on \$300,000 bonds for construction of municipal electric light plant.

Hamilton, Ont., Can.—Engineer E. J. Sifton has estimated cost of municipal power, lighting and distribution plant at \$502,000; plan includes 8,000 electric standards, placed 100 ft. apart over entire city, 200 commercial lighting customers and 1,000-H.P. for power customers; 3,051-H.P. will be required, and rates for house lighting will be 4 8-10 cts. per K.W.-hour, as compared with 7.52 now paid to the Cataract Power Co.—S. H. Kent, City Clerk.

CONTRACTS AWARDED

Webster City, Ia.—Furnishing equipment for municipal electric light and power plant to Murray Iron Works, Burlington, for installing engines, boilers, piping and heaters, \$12,200; to Westinghouse Electric & Manufacturing Co., Pittsburg, Pa., for electric generators and switchboards, \$9,998.

Midway, Ky.—Building municipal light plant, covering both generating station and line construction, to Moore-Young Electric Co., Lexington.

Springfield, Mass.—Furnishing additional equipment for electric light plant to General Electric Co., Schenectady, N. Y., \$3,377.50.

Iron Mountain, Mich.—Construction of a concrete dam and power plant for Peninsular Power Co., to the Newton Engineering Co., Milwaukee, Wis.

Marquette, Mich.—Construction of a dam on Dead River to Powell & Mitchell, Marquette, \$57,000; for Silver Lake dam to Wahlman & Trebilcock, Ishpeming, \$15,000.

New Hartford, N. Y.—Village Board has entered into contract with Utica Gas & Electric Co. for lighting of streets for period of five years.

Terrell, Tex.—Building concrete and steel power house to house city light and water plants to Sherwood Concrete & Paving Co., \$5,950.

Basin, Wyo.—Electric light and water works improvements to Katz-Craig Contracting Co., Omaha, \$58,582.72.

FIRE EQUIPMENT

Sacramento, Cal.—Plans for two new fire houses, one for the northeast and one for the southeast section of city have been approved by Fire and Building Committees of City Trustees. E. C. Hemmings and R. A. Herold, Architects; both houses will be equipped with auto apparatus.

Bridgeport, Conn.—Board of Fire Commissioners has recommended erection of fire house, truck house and building to house signal system.

Milton, Del.—Town will issue \$15,000 bonds to equip fire department and erect water plant.

Preston, Ida.—Volunteer fire department has been formed.—A. W. Stehen, Chief.

Decatur, Ind.—City has agreed to contract terms of which create stock company of twenty-five business men who are to build \$18,000 city hall and equip it with automobile fire department, they to receive stated dividend each year until amount is paid; committees have been appointed to purchase equipment and plans for building have been completed.

Fort Wayne, Ind.—Board of Public Safety will at once ask bids for 2,500 ft. of fire hose.

Wichita, Kan.—Fire Chief A. G. Walden has recommended purchase of 4,000 ft. of new hose and auto fire engine.

Winchester, Mass.—Site at Vine and Church Sts. has been purchased for erection of \$50,000 fire house.

Worcester, Mass.—Fire Chief Coleman is favorable to purchase two large combination trucks.

Bay City, Mich.—Auto combination chemical and hose wagon, together with a chief's auto, will be added to Fire Department apparatus.

Duluth, Minn.—Site at Seventh ave. East and Ninth st. has been purchased for erection of fire hall.

Billings, Mont.—Bids will soon be asked by Council for purchase of 1,000 ft. of fire hose.

Manchester, N. H.—City will erect fire station at Goffs Falls.

Newark, N. J.—Bigelow & Tuttle will prepare plans for erection of \$50,000 fire house for double company.

Dunkirk, N. Y.—Site on Eagle st. has been purchased for erection of proposed fire hall.

Far Rockaway, L. I., N. Y.—Plans have been filed for erection of \$50,550 fire house on Central ave. for Engine Co. 164.

Sauquoit, N. Y.—Fire company has been formed and chemical engine will be purchased.—W. D. Cress, Chief.

Ashboro, N. C.—Fire company has been organized.—S. B. Stedman, Chief.

Cuyahoga Falls, O.—Plans have been completed for fire station to be built on Broad st.; total cost will be about \$6,000.

Fremont, O.—Citizens will vote July 11 on \$54,000 bonds for fire department improvements and water main extensions.

Massillon, O.—Council has decided to purchase 1000 ft. of fire hose.

New Carlisle, O.—Council has decided to purchase 500 ft. of fire hose.

Yoe, Pa.—Citizens' Fire Company is considering erection of fire station.

East Providence, R. I.—Rumford Hose Co. has asked for \$800 ft. of hose.

Montpelier, Vt.—National Board of Fire Underwriters has recommended erection of central fire station; purchase of auto chemical engine equipped with two 50-gallon tanks; two horse hose wagons, new hose and minor equipment.

CONTRACTS AWARDED

Milltown, N. J.—Furnishing \$4,100 chemical fire truck to Boyd Bros. Co., of Philadelphia.

Albany, N. Y.—Repairs to fire truck 2, American-La France Fire Engine Co., \$3,900.

Beaumont, Tex.—Furnishing fire engine, cap. 13,000 gallons of water per minute, to Ahrens-Fox Fire Engine Co., Cincinnati.

BRIDGES

Tampa, Fla.—Commissioner Snow of First District will at once get estimates for widening bridge over Spanishtown Creek.

Tampa, Fla.—Board of Public Works has decided to ask for bids for erecting bridge over Hillsborough River at Lafayette st.

Covington, Ga.—Bids will be received for constructing a concrete bridge 20 ft. high, 60 ft. wide and 100 ft. long, and for paving with macadam a street 45 ft. wide, 1,400 ft. long. Geo. T. Smith, Mayor.

Michigan City, Ind.—County Commissioners have decided to erect \$6,000 bridge across Kankakee River.

Peru, Ind.—Commissioners of Miami and Cass counties are preparing to ask for bids for construction of a bridge over the Wabash River, between Jefferson Township and Miami Township.

Church Point, La.—Town will construct bridge and levee across Bayou Plaquemine.

Lafayette, La.—Council has authorized Street Committee to ask for bids to keep bridges and streets in repair.

Holyoke, Mass.—City Engineer T. J. MacCarthy has completed plans for Cabot St. canal bridge.

St. Paul, Minn.—Fred Nussbaumer, Superintendent of Parks, is having plans prepared for Park Commission, for a steel and concrete bridge across River Boulevard at St. Clair st.; cost, \$5,000.

Arlington, Neb.—Dodge County will build bridge across Elkhorn River.

Las Cruces, N. M.—Board of Trustees has ordered construction of 24-ft. bridge over Onquia at foot of Las Cruces Ave.

Geddes, N. Y.—Citizens have voted \$40,000 bonds to erect bridge near fair grounds and lay out highway from Solvay village to fair grounds.

Cincinnati, O.—City Engineer Shipley has submitted plans and estimates for flooring of the new Fern St. bridge; estimate is \$11,635, of flooring of reinforced concrete with covering of asphalt; plans and estimates for substructure of Ludlow Ave. viaduct, which is to eliminate the

grade crossing of the B. & O. Railroad have also been submitted to Director Sundmaker; cost, \$76,000.

Pittsburg, Pa.—Mayor W. A. Magee has recommended erection of Sawmill Run, Bloomfield and Sylvan Ave. bridges.

CONTRACTS AWARDED

Wilmington, Del.—Building bridge over western arm of Smyrna River to Jos. Anderson, Delaware City, \$4,500.

Salem, Ind.—By Washington County Commissioners for construction of one concrete and one steel bridge to F. J. and H. F. Burk, Richmond, Ind.

Waverly, Ind.—Construction of a 5-span concrete bridge across White River by the Morgan County Commissioners to National Concrete Co., \$38,750.

Mankato, Minn.—Constructing two concrete bridges, to Marsh Engineering Co., Des Moines, Ia., \$5,650.

Newark, N. Y.—Erecting three bridges on flats north of village during next three months to Oswego Bridge Co., largest bridge, \$4,500, and two smaller ones to Z. T. Darrow & Sons, Canandaigua, \$2,500 each; reinforced concrete will be used.

Milwaukee, Wis.—Constructing a 1-leaf bascule bridge across the Milwaukee River at Onelda st. to Milwaukee Bridge Co., Milwaukee, \$55,745 for superstructure, \$92,845 for entire work; other bidders: Modern Steel Structural Co., Waukesha, Wis., superstructure, \$71,469; Hell Co., Milwaukee, superstructure, \$53,875, entire work, \$99,875; A. Vogel, Starke Dredge and Dock Co., Milwaukee, entire work, \$104,272; Strobel Steel Construction Co., Chicago, Ill., superstructure, \$66,400; J. E. Hathaway & Co., Milwaukee substructure, \$44,000. L. J. Klug, Superintendent Bridges.

MISCELLANEOUS

Bessemer, Ala.—City is planning to erect \$30,000 hospital.

Decatur, Ala.—City has sold \$25,000 city hall bonds to W. N. Coler & Co.

Huntsville, Ala.—Bids will be received at once by Mayor Smith for erection of municipal hotel.

Moulton, Ala.—Lawrence County Commissioners are considering erection of jail.

Glendale, Ariz.—Town is considering erection of town hall and jail.

Pasadena, Cal.—The City Commissioners are considering plans for city aviary and will at early date have architects assist them in devising attractive birdhouse at Central Park.

Wilmington, Del.—Phoenix Fire Company has decided to purchase auto ambulance.

Washington, D. C.—Consul George Heimrod, of Berne, Switzerland, has reported that plans for municipal slaughterhouse, to cost several hundred thousand dollars, are being prepared by Architect Max Muench, of Berne, who has been allowed a period of six months by city for the completion of his preparatory work; American firms desiring to make offers for installation, etc., should address the Berne municipal building department (Stadtische Bau-Direktion, Berne), but letters, and, if possible, descriptions should be in German or French.

Albany, Ga.—Citizens have voted \$10,000 bonds to beautify and enlarge parks.

Freeport, Ill.—Dr. J. A. Poling has recommended purchase of three or four sanitary garbage wagons.

Poseyville, Ind.—Town will issue bonds to erect \$6,000 town hall.

Carlisle, Ky.—Council has decided on plans for erection of city hall on Chestnut St.

Boston, Mass.—Commissioner Rourke, of the Public Works Department, has rejected all bids received for disposal of the city's garbage and refuse for next ten years; he will at once prepare specifications for new bids.

Winchester, Mass.—Citizens have voted \$90,000 bonds for purchase of property for park and boulevard.

Newaygo, Mich.—Board of Corrections has ordered Board of Supervisors to erect permanent jail.

St. Louis, Mo.—Citizens will vote Nov. 7 on \$2,250,000 bonds for completion of municipal bridge.

Kearny, N. J.—To house town ambulance, patrol wagon and new auto fire apparatus; Town Council will erect a brick building at Berlin and Windsor Sts.

Westfield, N. J.—Park Commissioners have decided to issue \$10,000 bonds for improvement of Mountain av. park.

Woodbury, N. J.—Council has advertised for bids for automobile for use of Water Superintendent in going to and from pumping station.

Binghamton, N. Y.—As soon as specifications can be prepared Board of Contract and Supply will advertise for bids on remodeling, grading and improvement of Kent playground in Sixth Ward.

Schenectady, N. Y.—Bids will be received June 28, noon, for \$100,000 bonds for erection of jail and courthouse.—J. I. Winne, County Treasurer.

Toledo, O.—Service Director Cowell has \$12,000 available for purchase of six garbage wagons, equipment and horses.

Muskogee, Okla.—City and county officials are considering \$500,000 bond issue for erection of joint ten-story office building.

Klamath Falls, Ore.—Citizens will soon vote on \$30,000 bonds to erect town hall.

Pittsburg, Pa.—Mayor W. A. Magee has recommended passage of ordinance for erection of city hall and municipal refuse plant; also park and wharves improvement.

Salt Lake City, Utah.—Council has appropriated \$2,500 for use of Park Board in installing apparatus in playgrounds at Pioneer Park and to complete playgrounds at Liberty Park.

Portsmouth, Va.—Council has decided to erect modern \$40,000 office for clerks.

Upton, Wyo.—Owing to election contest, bids for proposed construction work will not be received until later date, probably about 30 days.—Burns & McDonnell, Scarlett Bldg., Kansas City, Mo., Engineers.

CONTRACTS AWARDED

Boston, Mass.—To F. S. Marvel, Newburg, N. Y., for building steel hull ferryboat for East Boston service, \$118,000.

Manchester, N. H.—Furnishing garbage truck to W. C. Shear, local agent for Peerless garbage truck, \$4,000.

Brooklyn, N. Y.—To Joseph N. Early, New York City, for furnishing 1,059 street signs of five different varieties in different parts of borough, \$1,495.80.

Schenectady, N. Y.—To Jas. H. Johnson, city, for erecting county tuberculosis hospital, \$35,471.

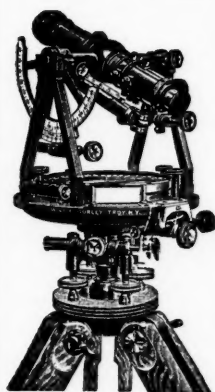
Doylestown, Pa.—By Bucks County Commissioners to W. A. Collins, of Falls Township, to build dykes at the mouth of Scott's Creek, \$4,895.

Salt Lake City, Utah.—Building city stables to P. J. Moran, \$42,647.

TOO LATE FOR CLASSIFICATION

BIDS ASKED FOR

STATE	CITY	RECEIVED UNTIL	NATURE OF WORK	ADDRESS INQUIRIES TO
STREET IMPROVEMENTS				
Wisconsin	Corliss	June 23, 8 p.m.	Constr. six blocks of cement sidewalks, and eleven st. crossings.	H. B. Schmid, Village Clerk.
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. 5,850 sq. yds. sheet asphalt paving; 4,043 lin. ft. combined curb and gutter.	R. C. Thompson, City Clerk.
Wisconsin	Green Bay	June 27, 2 p.m.	Improving various streets by grading, constr. sidewalks of Portland cement; concrete combined curb and gutter; paving with asphalt, vit. brick, tar macadam or creosoted wood block 53,000 sq. yds. paving; 27,400 lin. ft. curb and gutter.	W. W. Rand, City Engineer. Clarence Bird, Village Clerk.
New York	Saratoga Spgs.	June 28, 3 p.m.	Constructing concrete walk.	C. M. Robertson, Clk. Dept. P. Serv.
Ohio	Hamilton	June 29, noon	Improving portion of Fairgrove Ave. by paving roadway with bituminous macadam.	John W. Gauthier, Dir. Pub. Serv.
Ohio	Akron	June 29, noon	Paving portions of various streets.	Bd. Freeh., Hudson County.
New Jersey	Jersey City	July 5	Paving the Plank road.	
SEWERAGE				
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. 5,170 ft. 10-in. sewers; 1,890 ft. 12-in.; 1,220 ft. 15-in.; 400 ft. 30-in.	R. C. Thompson, City Clerk.
New York	Frankfort	June 29	Constructing a complete sewer system.	H. Seymour Getman, Chm. B. S. C.
Pennsylvania	Ligonier	July 1	Building sewage disposal plant, including sedimentation tank, sprinkling filter, sludge bed and pumping station; F. H. Shaw, Lancaster, Engineer.	I. F. Brandt, Boro. Clerk.
New Jersey	Elizabeth	July 3, 8:30 p.m.	Constr. 665 ft. 24-in. pipe sewer; 510 ft. 20-in.; 510 ft. 18-in.; 560 ft. 15-in., house connections, and appurtenances.	N. K. Thompson, Street Comr.
Iowa	Valley Junction	July 13, 7 p.m.	Constr. 5½ miles 8 to 20-in. sewers and a sewage disposal plant	Iowa Engr. Co., Clinton, Ia., Engrs.
Georgia	Macon	July 10, noon	Digging trenches and laying 5,003 ft. 12-in. pipe; 3,140 ft. 8-in.; 5,363 ft. 6-in., hydrants, valves, special castings etc.	John T. Moore, Mayor.
WATER SUPPLY				
Pennsylvania	Franklin	June 28, 3 p.m.	Furn. one horizontal duplex direct acting triple expansion steam pumping engine, daily capacity 3,000,000 gals., with foundations, erected complete. One tubular 72-in. by 18-ft. horizontal 150 pounds working steam pressure boiler, with dome, complete and wrought iron stack 100 ft. high.	Geo. S. Criswell, Chm. B. W. Comrs. Wm. T. Patton, Town Clerk.
Indiana	Rockville	July 3, 2 p.m.	Digging a well 8-ft. in diameter and 32 ft. deep, walled with con.	
LIGHTING AND POWER				
New York	Buffalo	July 1, 11 a.m.	Furn. and erecting power plant equipment at tuberculosis hospital at Perrysburg, N. Y.; power house and laundry; wiring to main building; constr. water supply system laundry machinery, ice machinery.	Francis G. Ward, Comr. Pub. Wks.
BRIDGES				
Iowa	Waterloo	June 26, 7:30 p.m.	Constr. concrete steel arch bridge over cut-off on Whitney road.	R. C. Thompson, City Clerk.
FIRE EQUIPMENT				
Pennsylvania	Oil City	June 26, 7:30 p.m.	Furn. 2,500 ft. 2½-in. fire hose; 500 ft. ¾-in. fire hose.	C. W. Mullalley, Comptroller.
MISCELLANEOUS				
Connecticut	Waterbury	June 27, 8 p.m.	Remodeling City Hall.	James R. Lawlor, Clk. B. C. P. Wks.
New Jersey	Garwood	July 5, 8 p.m.	Constructing a borough hall.	Wm. Darroch, Boro. Clerk.



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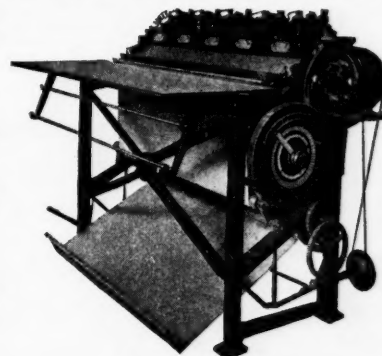
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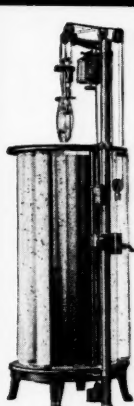
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STREET IMPROVEMENTS

Washington, D. C.—Arrangements have been made by office of public roads of the Department of Agriculture to put in two miles of demonstration road, running from Chevy Chase Circle to and beyond Bradley lane; half of the road will be built with an appropriation of \$10,000 that will be available from national government July 1, and similar amount will be contributed by Maryland.

Washington, D. C.—District Commissioners have passed orders for repaving A St. N. E. at estimated cost of \$2,500.

Crawfordsville, Ind.—City will lay 6534 sq. yd. of paving and 3 m. of 5-ft. concrete walks and gutter.—N. C. McClure, City Civil Engineer.

Clinton, Ia.—Council has ordered repaving of Fifth ave.

Des Moines, Ia.—Council has decided to pave with sheet asphalt, Thirty-third, Westworth and Twentieth Sts.

Kearny, N. J.—Council is planning street improvements, including repaving of Kearny ave. from Harrison ave. to Bergen County line at cost of \$150,000.

Pittsburg, Pa.—Council is considering ordinances for grading, curbing and paving four streets.

CONTRACTS AWARDED

Denver, Col.—To Colorado Company, for the work in West Twenty-third Avenue Paving District No. 2, \$21,771; other bidders: Denver & Pueblo Construction Co., \$22,293, and Commonwealth Construction Co., \$22,805; work calls for the paving with asphalt macadam a total of 14,912 sq. yds.

Grand Rapids, Mich.—To C. E. Williams, for improvement of Clancy st. with West-rumite.

Hibbing, Minn.—Curbing and guttering several blocks of streets to Johnson-Mey-nah Construction Co., 39½c. per lin. ft.

Virginia, Minn.—Laying 23 blocks of bitulithic paving on concrete base on Cleveland, Mesaba and Central Aves. and Cook and Spruce Sts. by the Council to the H. L. Bartlett Co., Virginia, \$83,856.60, or \$2.40 per sq. yd. for laying paving and 60c. per cu. yd. for excavating; F. Mc-Donnell, Duluth, was awarded the contract for laying 13 blocks of creosote block paving on concrete base, 3½-in. block, weighing 16 pounds, \$2.61 per sq. yd. for paving and 68c. per cu. yd. for excavating; total, \$37,005.58. The other bidders were Warren Bros., Duluth; C. C. Butler Contracting Co., Virginia; the Pastoret-Lawrence Co., Duluth; J. P. O'Connor, Duluth.

Hastings, Neb.—Paving with asphalt St. Joe and Denver aves., to M. Ford, Omaha, \$2.11 per sq. yd.; combined curb and gutter, 54c. per lin. ft.; resetting old curb, 10c. per lin. ft.; paving brick portion of same thoroughfares, to E. R. Bing, city, \$1.88 per sq. yd. for Hastings brick block paving.

Roselle, N. J.—Curbing and guttering Chestnut st. and Fourth ave., to the A. L. Clark Stone Company, Elizabeth, 81c. per lin. ft., there being 6,243 lin. ft.

Rochester, N. Y.—By Board of Contract and Supply to Whitmore, Rauber & Vincius for Park Ave. and Gardner Ave. asphalt pavements, \$26,120 and \$15,613; Copeland St., brick pavement, to Clarence Aikenhead Co., \$6,033; Pinnacle Road, brick pavement, to F. V. Brotsch, \$7,858; Magee Ave., cement walks, to W. A. Margrander, \$893; Mohawk St., grading and walks, to Julius Friedrich Co., \$619.50.

Toledo, O.—By Board of Control to establish the grade of Post St. at the Lake Shore & Michigan Central tracks to Chas. P. Peters & Son, \$23,947.

York, Pa.—To York Stone & Supply Co. to furnish broken stone for asphalt paving on West Philadelphia St., \$1.15 per perch.

Sumter, S. C.—To Geo. W. Waring, Columbia, to put down paving on Main st. roadway.

Lynchburg, Va.—To S. B. Bennington, for building tar macadam driveway in Miller Park, about \$5,000.

SEWERAGE

Washington, D. C.—Report from American consular officer states that municipality in his district is contemplating establishment of new sewerage system within 6 or 8 months; preliminary work is now being carried on by an engineer, and report suggests that American manufacturers of sewerage equipment should get in communication with this person as soon as possible, with view to having their equipment adopted in system. Address No. 6834, Bureau of Manufacturers.

Fort Dodge, Ia.—Council is considering construction of sanitary sewer on Seventh ave. North.

Beverly, N. J.—Council has authorized building of 3,300 ft. of 8-in. sewer pipe on Broad st.

Pittsburg, Pa.—Council is considering ordinances for sewerage nine streets.

Aberdeen, S. D.—W. P. Mason, Troy, N. Y., and City Engineer R. B. Easton will inspect system of sewage disposal now in operation at Santa Monica, Cal., and later report to Council if system is practical for this city.

Richmond, Va.—Council has ordered construction of sewers on following streets: Beverly, \$2,113; Lodge st., \$1,256, and Clay, \$2,388.

Rocky Mount, Va.—Citizens have voted \$75,000 bonds for establishment of sewerage, water works and municipal electric light plant.

Seattle, Wash.—Board of Public Works has rejected all bids for constructing sewers on Eleventh ave. West, and will ask new bids.

CONTRACTS AWARDED

Clinton, Ia.—To Greene & Son, Appleton, to complete sewer system, Dist. 4, \$124,375.

Grand Rapids, Mich.—To Carpenter & Anderson, for building east side sewer, \$356,722.63.

Richmond, Va.—Constructing sewer on Thirty-first st., to H. W. Maynard & Co., \$6,727.

LIGHTING AND POWER

Elkhart, Ind.—Indiana & Muncie Electric Company has announced plan to rebuild dam over St. Joseph River and erect a power house developing 2,500 horse power.

North Branch, Minn.—Council has granted franchise to Eastern Minnesota Power Co., Pine City, to operate electric light.

St. Paul, Minn.—Chief Engineer Claussen has completed specifications for city lighting covering gas and electric lighting and gasoline lamp post system; bids will be asked on at least twelve propositions in connection therewith.

Clydepark, Mont.—W. B. Calhoun is interested in proposed installation of electric light plant.

Hardwick, Va.—Village has appropriated \$65,000 to increase electric light plant; \$15,000 will be spent for equipment.

Rocky Mount, Va.—Citizens have voted \$75,000 bonds for establishment of municipal electric light plant, water works and sewerage.

Spokane, Wash.—Henry L. Doherty & Co., controlling Spokane Falls Gas Light Company, will expend \$500,000 on erection of gas plant.

FIRE EQUIPMENT

Washington, D. C.—American consul in Canada reports that at recent meeting of town council in his district an order was passed instructing Town Clerk to write manufacturers of motor fire trucks for prices and other information; combination hose and ladder truck is desired, which could also be used, by removing the top, for coal-hauling purposes. Address No. 6879, Bureau of Manufacturers.

Ventnor, N. J.—Ventnor Fire Company is urging purchase of chemical engine and bettering of fire alarm system.—Address Chief Kuhl.

Tacoma, Wash.—Council is considering erection of \$28,000 fire hall at E. 26th and C sts.

CONTRACT AWARDED

Lansford, Pa.—Installing fire alarm system, to the Gamewell Fire Alarm Telegraph Co., \$1,700.

BRIDGES

CONTRACTS AWARDED

Sherburne, N. Y.—By highway authorities of the towns of Hamilton and Sherburne, for building abutments for new cement bridge over Chenango River in Earlville, to C. C. Chandler, Earlville.

Richmond, Va.—To George Donald, for building reinforced concrete arch bridge over Gillies Creek; \$9,011.93.

MISCELLANEOUS

New Haven, Conn.—City has been granted authority to issue \$75,000 bonds to erect contagious disease hospital.

BIDS RECEIVED

Boston, Mass.—By Park Commissioners for construction of the bear-den section of Franklin Park Zoological Garden; J. A. Rooney, lowest bidder, \$11,445; the other bidders were: Carroll Construction Co., \$11,750; M. F. Culbert, \$12,850; West Roxbury Trap Rock Co., \$21,795, and the Timilty-Shawmut Construction Co., \$22,221; iron work of den, Smith Construction Co., \$7,700; W. A. Snow Iron Co., \$7,740, and F. A. Houdlette & Sons, \$17,435.

PROPOSALS

FIRE HOSE

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The undersigned will receive bids up to 7:30 P. M., Monday, June 26, 1911, for furnishing the following fire hose:

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BOOK NOTICE

Clarification of Sewage.—By Rudolf Schmeitzner. Translated by A. Elliott Kimberly. Cloth, 7½ x 5 in., illus., 15 + 114 pp. New York, The Engineering News Publishing Company; London, Constable & Company, Ltd., 1910, \$1.50.

This book is the result of a visit by the author to a number of the larger German clarification plants where preparatory devices constitute the entire treatment of sewage. The plants are discussed from an engineering standpoint, the chemical and bacterial phases of the question being but briefly mentioned, and the book is a critical review of the design of screens of various types of sedimentation tanks, of towers, and of methods of sludge removal and disposal at present in use in Germany. The Contents are: Introduction; General Principles of the Design of Clarification Plants; The Composition of Sewage; Component Parts of a Clarification Plant; Sludge Removal and Treatment for the Recovery of By-Products; Practical Arrangement of Clarification and Purification Plants; Addendum; List of Plates; Index.

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